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COMPUTERWORLD

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Good times rolling again at Kawasaki as IS group revs up network influence following decade-long rebuilding plan. Page 51.

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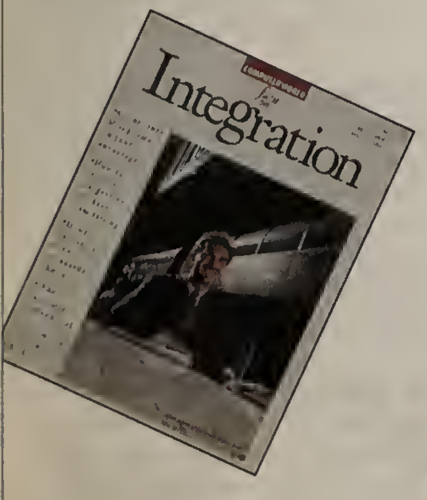

NEWSPAPER

SECOND CLASS

Focus takes SQL Server advantage

BY ROBERT MORAN
CW STAFF

NEW YORK — Information Builders, Inc. cracked through the ice encasing SQL Server by unveiling a front end last week that it said will end the wait for the client portion of client-server architectures.

The company introduced Focus for SQL Server, an interface that allows the PC/Focus database and facilities to be used against the SQL Server database, a joint venture of Ashton-Tate Corp., Microsoft Corp. and Sybase, Inc. that began shipping at the end of April.

"Now we can start doing some serious applications development in a distributed environment on personal computers," said beta-test user John Tarbox, president of Canaan Analytics, Inc. in Wilmington, Del. "For the first time on the PC, we really have a true database."

Tarbox, who is an independent applications developer, said that SQL Server, which is based

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IBM to high-end users: Pay up

Mainframe software strategy emphasizes tiered pricing, monthly fees

BY STANLEY GIBSON
CW STAFF

IBM reshuffled its 370 software pricing last week, and high-end users are going to have to dig into their wallets.

The price changes are intended to funnel more customers into monthly licensing agreements and away from onetime charges.

In the announcement, IBM brought graduated pricing to 140 software products, pushing the total number of IBM 370 software products that now fall under that pricing scheme to approximately 250 to 300.

Although IBM has some 2,000 370 software products, those now under graduated pricing represent the vast majority of the 370 software installed base, according to an IBM spokesman.

Most of the steep price increases are for widely accepted software, and users with processors in Groups 30, 40 and 50 will feel the brunt of the price hikes. The price increase for VM/SP running on a 3090 Model 600S (in Model Group 50) jumped from $44,010 to $73,000 for a onetime charge.

Users at the low end of IBM's mainframe line, including 9370 and 4381 users, get off lightly, sometimes receiving small price reductions on monthly leases. The graduated pricing changes go into effect in January.

"Our desire is that people move to graduated monthly licenses. There's a very clear message," an IBM spokesman said. He said the push to monthly leases is intended to make it easier for customers to move to the most current versions of software and develop an investment stream for future IBM software development.

IBM quoted a sample 3090 Model 600S configuration in which the total software bill increased by 13%. Bob Tasker, an analyst at International Data Corp. in Framingham, Mass., calculated that a user with a 3090 Model 600S will pay about $300,000 more per year for software. Tasker predicted that IBM will gain $500 million to $700 million per year in revenue from the price changes. "The smaller high-end customers will feel the pinch more. They'll pay more in relative terms," he said.

Although users with large data centers pay the largest sums, they have extremely high computing costs — particularly

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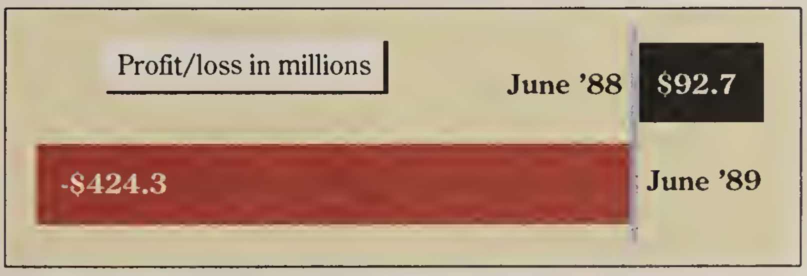
Wang adds up dire news



Wang 'bites the bullet' *and lumps tremendous restructuring costs into fourth-quarter losses. See story page 4.*

Bank tallies PS/2 asset

BY CHARLES VON SIMSON
CW STAFF

SAN FRANCISCO — Bank of America plans to install 10,000 OS/2-based workstations and file servers later this year. However, while taking advantage of the operating system's multitasking functions for loan officers, the bank will stick with DOS for an equal number of IBM Personal System/2s earmarked for teller stations.

The extensive PS/2 networking project is a central part of Bank of America's information technology strategy for the next decade. "We have known for a long time that we would go to OS/2," said Ralph Schaffner, vice-president of end-user computing. "It was just a question of timing."

Despite a persistent lack of applications specifically designed to use OS/2 features and a recent survey indicating that 86% of U.S. corporations are neither using nor planning to use OS/2 (see story page 37), Bank of America executives see the operating system as the wave of the future.

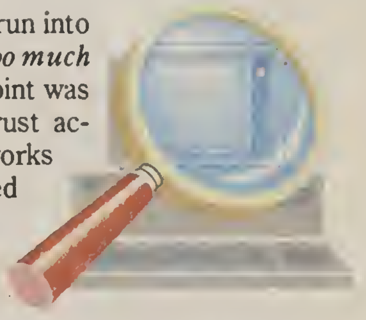
"Even if Presentation Manager applications don't ever work, you still have a programmable workstation with 16M bytes of memory address capacity," said Michael Simmons, IS director at Bank of America. "Everything else is gravy."

Simmons said the customer on-line information network system will allow the company to

Continued on page 4

Strategic systems: Pitfalls in stomping competitors

BY MITCH BETTS
CW STAFF



Strategic information systems can run into antitrust problems if they provide *too much* of a competitive advantage. That point was driven home by two recent antitrust actions involving computerized networks run by companies that have achieved market dominance.

In the past two months, antitrust lawsuits have involved American Airlines, which has the largest on-line reservation system in the U.S., and Mastercard International, Inc. and Visa International, Inc., which together control 90% of the revolving credit industry.

Antitrust liability is one of the legal risks that corporations run when they use information as a competitive weapon, especially if the company has a dominant market share in a particular niche or region or if it controls an essential network, according to Peter Marx, a Wellesley, Mass.-based attorney who specializes in information law.

In June, the U.S. Department of Justice blocked a proposed

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101 Lotus, Symantec ready tools for Tandy's desktop.

Quotable

"I understand from a technical point of view that the transition is necessary, but I don't know when the value will be there."

ARNOLD BIRENBAUM
BANK OF AMERICA

On managing OS/2 migrations. See story page 37.

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UPDATE

Which one of these selected headlines from last week is fictitious? 'Economic outlook dims, fueling recession fears.' 'Stock market rally may be for real.' 'Stocks end lower as recession worries take grip.' 'Economy generates 155,000 new jobs in July.' 'Purchaser index dropped in July to six-year low.' 'Big retailers report monthly gains.' 'Sagging growth is the worry of the week.' 'OTC market hits record high.' 'Spending growth halted in June.' 'Poll puts consumer confidence at 20-year high.' 'Rose admits he bet on baseball, enters priesthood.'

TOM MONAHAN

EXECUTIVE BRIEFING

■ **For all the talk about the need for strategic systems,** there can be such a thing as too much of a competitive advantage for the information-oriented corporation. Recent legal actions raise the specter of antitrust findings at those firms that do too good a job with their use of information technology to gain the edge on their rivals. **Page 1.**

■ **Software prices are heading up** as part of an IBM restructuring plan that has the company raising some prices, cutting a few others and steering customers from one-time charges into monthly leases. IBM also made it clear that tiered pricing, in which software is priced according to the power of the hardware platform used, is here to stay. **Page 1.**

■ **Mergers and acquisitions** will continue to spur corporate streamlining, but managers who are prepared can turn an early retirement program into an opportunity rather than a threat. They might apply critical success factors to their own career and act as if they might make a career move next week. **Page 81.**

■ **If you think the college graduate** of today isn't a match for that of yesterday, take a cue from Reynolds Metals' James T. Matsey. As corporate director of information systems at Reynolds, Matsey says that his group's training efforts can work to fill in educational gaps as long as a job candidate displays the technical skills and good business sense that he wants. **Page 51.**

■ **New communications options** are improving the credibility of Apple's Macintosh in the corporate computing arena. Mac links to networks, VAXs and IBM mainframes have helped dispel the corporate users' view of the Mac as an ineffective business machine. Apple itself has a four-pronged connectivity strategy. Meanwhile, third-party vendors are providing value-added features such as electronic mail and cooperative processing applications. **Page 61.**

■ **The sad days slogged by for Wang** last week when the company released financial results that were worse than anyone expected: a quarterly loss of $374.7 million and an annual loss of $424.3 million. **Page 4.**

■ **DEC's database strategy is reminiscent of IBM's.** DEC has crowned RDB as its strategic database management system while promising continued support for an upcoming Ultrix-based system and its older DBMS and RMS packages. Observers note that the situation is similar to what IBM did when it urged users to shift to DB2 while offering what some saw as a half-hearted commitment to its IMS and VSAM. **Page 23.**

■ **Answering a few simple questions** can indicate whether your information systems training is attuned to corporate goals. The questions concern the content of reports to superiors, the issues that arise in those individuals' performance reviews and the nature of the chief difficulties facing the IS organization. **Page 96.**

■ **Credibility is the issue** as IBM seeks to address IS management concerns about mainframe disk storage. In light of IBM's history of problems with storage, it's time for the organization to explain to managers why it canceled the planned announcement of a new high-end disk drive last month. **Page 23.**

■ **The IS group at Kawasaki Motors** wasn't where the good times rolled 12 years ago. Now, executives say they have rebuilt that group and overcome the cost and performance problems of 1977. **Page 51.**

■ **Managing the migration** to OS/2 is more than a technical challenge. One job for the IS executive is to convince users who control budgets to pay a high price for an operating system that still lacks applications and much of its promised functionality. **Page 37.**

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Wang dives into troubled waters

BY PATRICIA KEEFE
CW STAFF

LOWELL, Mass. — There is something to be said for jumping straight into a cold body of water. It is guaranteed to shock the system, but on the whole, it is much less painful than gingerly wading in one frozen inch at a time.

That may have been the thinking at financially strapped Wang Laboratories, Inc. last week. Despite years of lethargy, analysts said, the shell-shocked minicomputer maker managed to startle even its harshest critics with a $374.7 million fourth-quarter loss, bringing the total fiscal 1989 deficit to $424.3 million.

Wang users and developers were surprised by the magnitude of the loss but predicted Wang's financial woes will mostly hurt its efforts to gain new accounts and survive technology reviews under way at existing sites.

"I can understand where some customers who are in the midst of a reevaluation might take a second look at Wang, but any company with substantial money invested in Wang [systems] intends to be with the vendor for a while," said Matthew Gillman, chairman of the steering committee of the U.S. Society of Wang Users.

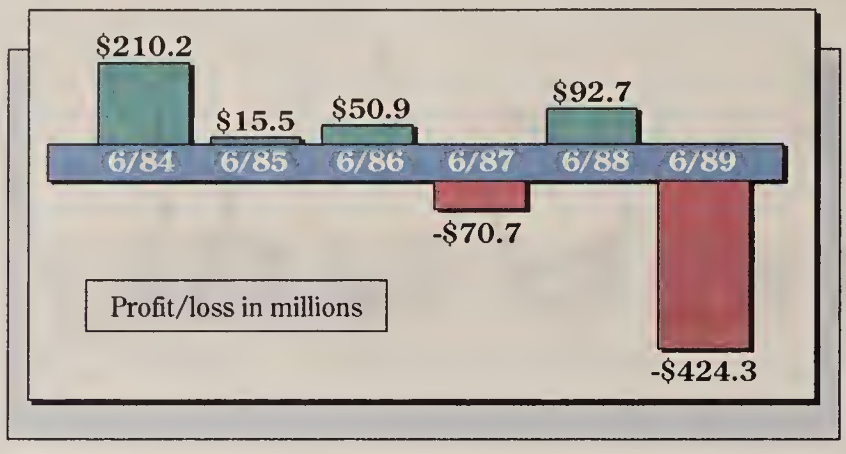
Nissan Motor Corp. USA, which currently supports 19 Wang VS systems and 51 IBM 8100s, began a review nine months ago to select a standard distributed processing platform, according to Lee Roberts, a technical support manager at the Gardena, Calif., company. "The financial viability of a company that you're planning to do long-term business with would certainly be a consideration, although not an overriding criterion," he said.

James Niquette, a Wang user and systems consultant with Software Business Applications in Chicago, added, "This will impact someone about to make a [Wang] purchase over the next 180 days." In those cases, IS will most likely find their recommendations under far greater scrutiny from corporate controllers and accountants, he said.

Other users agreed with Gillman, who said Wang has a year-long window to right its precarious financial situation. Wang said it expects to end fiscal 1990 with a profit, but Jeff Governman, a financial analyst at Soundview Financial Group in Stamford, Conn., predicts that "customers [won't] accept four straight quarters of losses."

How bad can it get?

Wang's loss for fiscal 1989 dwarfs combined profits of the previous five years



CW CHART: FRANK C. O'CONNELL

Other users said they have relatively small Wang investments and for a variety of reasons — pricing, compatibility and support issues — had already decided to either keep it that way or migrate to another platform. Wang's losses "just reinforced our decision to get out from under Wang," said David Pinkus, MIS director at Fuller Co. in Bethlehem, Pa.

Hoping that the worst is behind it, Wang has launched an aggressive campaign to assuage the fears of a restless installed base and woo new contracts in vertical markets. Out pounding the pavement is company President Frederick Wang, who has personally called upon several hundred accounts during the last three months.

In letters mailed out to Wang's top 150 customers last week, Wang characterized the fiscal year as "very tough and disappointing." However, he pledged to further drive down costs "in a way that does not impact on the level of service and support we provide you."

The tough decisions included a pretax $234 million restructuring charge and another $30 million chalked up to a onetime tax charge. Write-downs accounted for $170 million of that restructuring figure and included Intecom, Wang's Allen, Texas-based private branch exchange subsidiary. The firm also said it cut annualized costs and expenses by $200 million.

In short, Wang took every possible hit it could and then projected profitability by its third fiscal quarter of 1990.

"What you've seen us do in the fourth quarter is bite the bullet, taking one big [hit] to get this all behind us," said Kenneth Olisa, Wang's vice-president of worldwide marketing. What you will not see, he continued, is a move to significantly downsize the company: "It's not a goal."

Reacting to the loss, Wang closed or downsized two offshore operations, announced further personnel reductions and contracted with two financial advisers — Salomon Brothers, Inc. and Lodestar Group — to investigate long- and short-term financing options, including the possibility of minority investments and the sale of certain assets.

Two likely sell-off candidates are Intecom and Wang's leasing division. "We can do just as much business with them as without them," said Olisa, adding that he wanted to dispel any notion of a "panic action" or "fire sale."

Wang's strategic plan for the 1990s focuses on four key vertical markets: government, financial services, manufacturing and professional services. It also expects to benefit from its "strong lead" in the emerging image technology market.

Can it work?

Analysts question whether imaging can provide the company with any short-term gains. "It's generating a lot of noise and it's doing okay, but it's so small it's difficult to say whether it can pull them out," said Shao Wang, a financial analyst with Smith Barney, Harris Upham & Co.

A former Wang salesman added that the company expects a two-year sales cycle for imaging but actually faces a four-year siege. "Nothing is coming in to pay the bills," he complained.

The company, however, claimed $100 million in revenue from imaging products in the year, and Olisa said he expects it to double this year. Frederick Wang, in his letter to customers, said imaging and open architecture will be a major focus of the company's efforts and pledged that research and development will not be affected.

Olisa does not deny that the existing customer base "is feeling battered and bruised." Wang has moved to assure users that it is not walking away from the customer base. Olisa claimed that while Wang is pulling away from being a general-purpose mini maker, it is not going to the extreme of Data General Corp., which he said more or less announced that "the old line is gone, and we are now a Unix company."

PS/2 assets

FROM PAGE 1

branch into advanced technologies such as image processing as they become cost-effective.

But the Bank of America system is not a blanket endorsement of OS/2 for all. "We didn't see a real business need for OS/2," Schaffner said. "For the type of single-stream applications they handle, DOS has plenty of functionality."

Schaffner is responsible for the day-to-day implementation of the workstations and servers; he said that the branch office's multitasking requirements called for OS/2. DOS' 640K-byte memory limitation was another major factor, he added.

Bank of America is committed to installing between 18,000 and 20,000 PS/2s running OS/2 and DOS over the next year. Twelve hundred of a planned 10,000 PS/2s have been installed as DOS teller systems as part of a project that began in March 1988.

JOHN OWENS

Bank of America's Simmons

The bank has installed hardware for 3,000 of a planned 8,000 PS/2 Model 55 retail platform workstations — systems running OS/2 that will support retail lending and customer service applications at 920 branch locations across California.

The workstations will begin to come on-line with the installation of the first of COIN's 2,000 PS/2 Model 80 file servers during the fourth quarter. Twelve hundred Token-Ring local-area networks running LU6.2 will connect the servers and workstations to dedicated COIN trunk lines. The project costs over $100 million, according to Bank of America sources.

The COIN system offers redundant service in case of carrier failure and provides access to remote applications from a single workstation. Stations are linked to existing information databases resident on mainframes in Los Angeles and San Francisco. Automated teller machines, home banking and other information sources will be connected to COIN via existing links.

The COIN system connects DOS systems and teller and platform systems via branch servers. The OS/2 servers are currently in beta testing, and no significant problems have been reported.

COMPUTERWORLD

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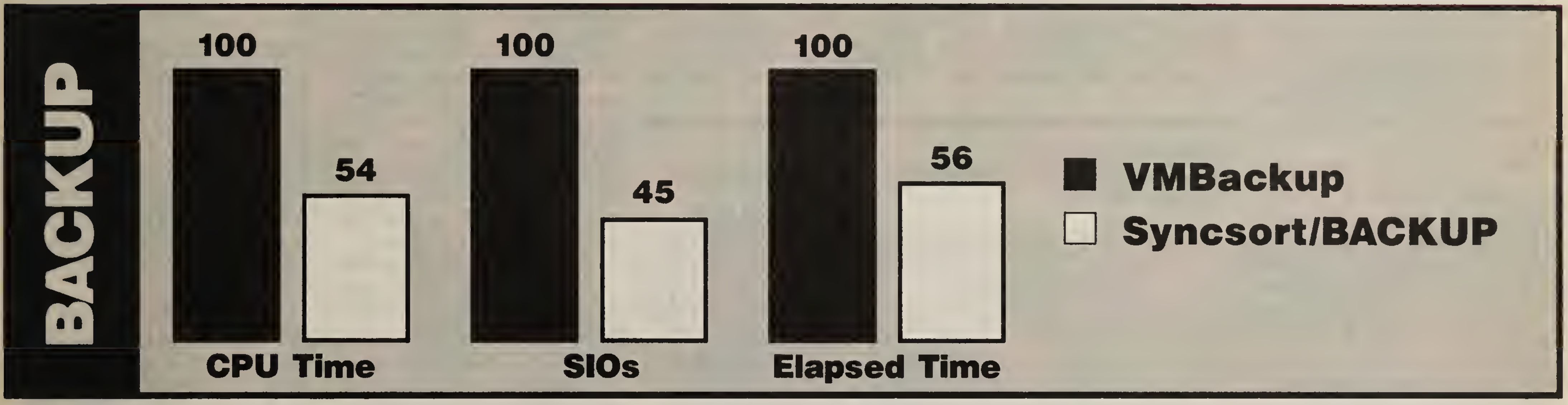

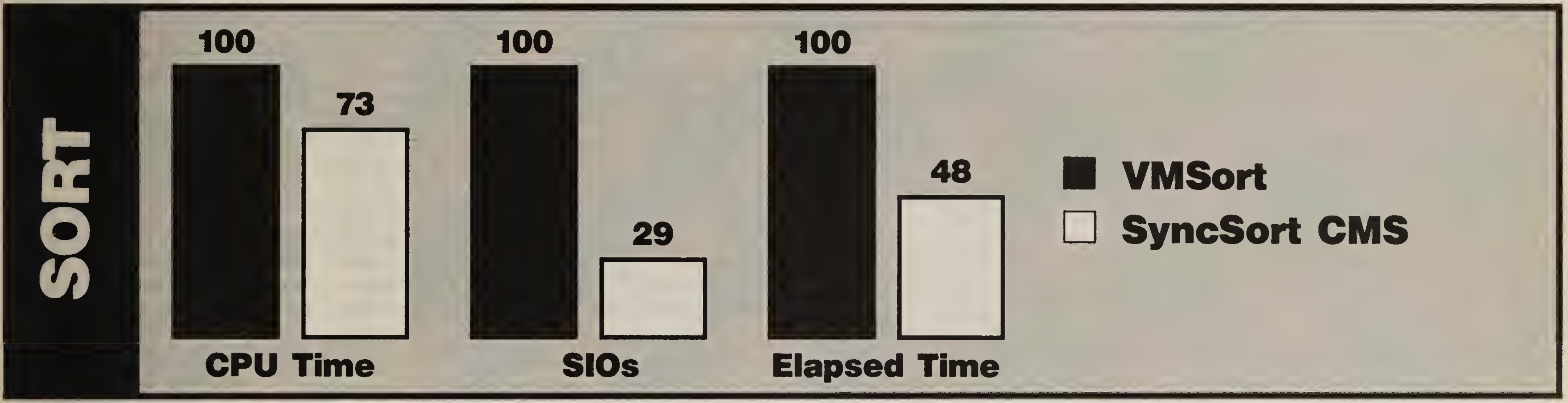

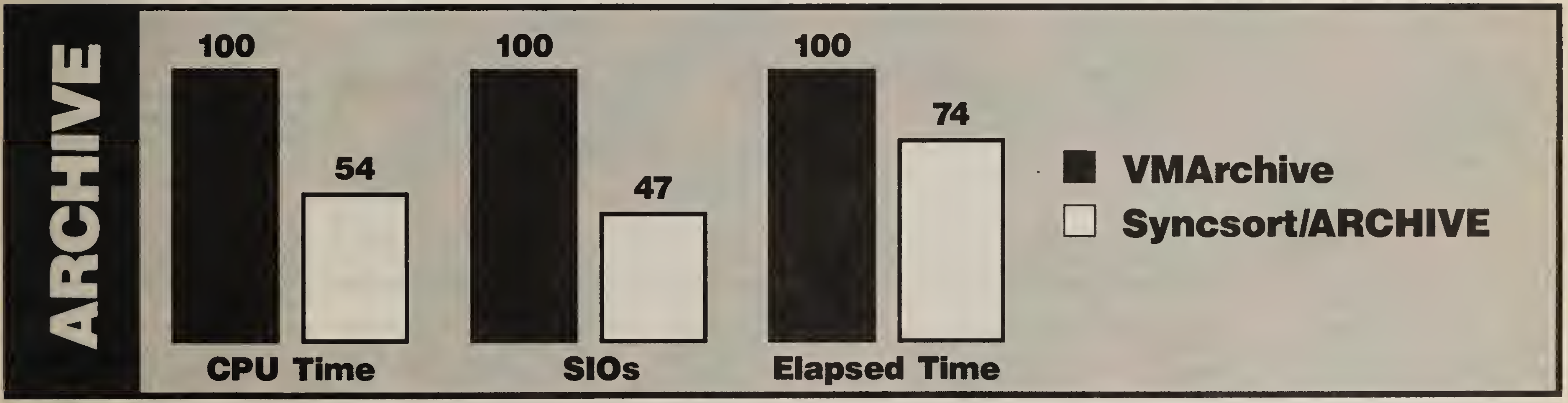

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Timeplex ready for optic net

BY ELISABETH HORWITT
CW STAFF

WOODCLIFF LAKE, N.J. — Timeplex, Inc. last week became the latest networking vendor to announce plans to support Synchronous Optical Network, or Sonet, an emerging standard that promises to provide Fortune 500 users with both the bandwidth and the network control services they will require for the 1990s.

The Unisys Corp. subsidiary has agreed to acquire Broadband Telesystems Corp., a Pleasanton, Calif., start-up that specializes in high-speed network equipment. By making use of Broadband's technology, Timeplex hopes to hasten its own introduction of products to support both the Sonet standard and T3 transmission rates of 45M bit/sec., Timeplex President Victoria Brown said.

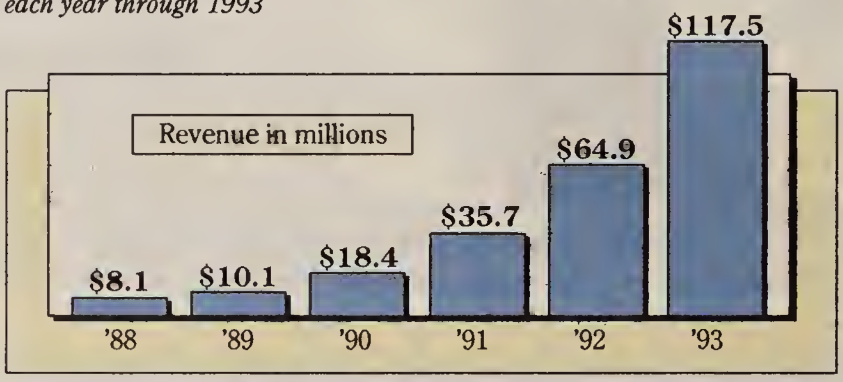
The T1 switch vendor's entry into high-speed networking will come none too soon, according to Vertical Systems Group. The end-user market for T3 multiplexers, only $10.1 million this year, will rise more than 80% each year to $117.5 million in 1993, according to a report recently published by the Dedham, Mass., research firm (see chart).

User applications that will "chew up all that bandwidth" include videoconferencing, image transfer and interconnection of local-area networks — particularly the new breed of LANs that can support 16M to 100M bit/sec., according to Tim Zerbiec, a principal at Vertical Systems.

Major carriers such as AT&T and T1 equipment vendors such as Timeplex's archrival Network Equipment Technologies, Inc. (NET) have already introduced T3 products. But such offerings are based on the old T1-type technology, which cannot take full advantage of carriers' multigigabit fiber-optic backbones.

Crossing your Ts

The U.S. end-user market for T3 multiplexers is projected to almost double each year through 1993



SOURCE: VERTICAL SYSTEMS GROUP
CW CHART: FRANK C. O'CONNELL

Sonet is the next step needed for the industry to effectively use and manage the huge amount of bandwidth available on the major carriers' fiber-optic networks. The technology is said to support transmission rates of 52M to 12.5G bit/sec., with the industry targeting initial speeds of up to 2.5G bit/sec.

The standard is not yet fully defined, so commercial Sonet offerings that are expected to arrive next year will be essentially proprietary, sources said. However, European and U.S. standards bodies are expected to produce a full, consensual standard in the next couple of years.

Sonet is likely to become the "high-speed substrate" for the National Science Foundation's NSFnet, according to Steve Wolff, the organization's director of networking. "The nice part about Sonet is that it provides a standard for very high-speed communications indeed, and the European and American versions are being harmonized so we will be able to interoperate with Europe," Wolff said.

Sonet will provide users with more than speed. The huge amount of available bandwidth will allow carriers to include far more sophisticated network management and control information on individual links — information that takes up too much overhead on existing T3 networks, said MCI spokesman Ned Farinholt.

Sonet technology will enable carriers to provide users with more effective fault isolation, more complete traffic and error information and more dynamic bandwidth control for reconfiguration and network recovery, Farinholt indicated. MCI and other major carriers are doing pilot tests of Sonet now, he added, and "there will certainly be Sonet connections next year."

By 1993, approximately 15% of fiber-optic circuits provided by carriers will be Sonet-based, according to Trans-Formation, Inc. But this hinges on the industry agreeing on specifications and beginning to offer compliant equipment by 1991, the Tulsa, Okla., research firm said.

This could pose a challenge to vendors such as Timeplex and NET, which must migrate their existing T1 multiplexers to Sonet in order to maintain full support of high-speed carrier services. NET made its Sonet move last April when it announced intentions to develop high-speed networking devices based on Tellabs, Inc. equipment. Both NET and Timeplex said they plan to make their product compatible with existing T3 products.

IBM

FROM PAGE 1

Scanning the bottom line

Under a revised pricing plan, high-end customers will feel a much sharper pinch than those at the low end under IBM's basic monthly license charge

Processor group	Typical processor	VM/SP		SQL/DS V.1		DB2 V.1	
		Old	New	Old	New	Old	New
10	9370 Model 20	$630	$615	$561	$650	Not available	Not available
20	4381 Model 21	$630	$904	$561	$760	$2,945	$2,945
50	3090 Model 600S	$630	$1,045	$561	$1,055	$2,945	$3,890

SOURCE: IBM
CW CHART: JOHN YORK

for hardware — so that the price hikes will be spread over large amounts of equipment.

IBM did give back with one hand some of what it took with the other: It eliminated initial licensing fees, effective immediately, for almost all of the 370 software and eliminated multiple charges for different versions of the same software. That is intended mainly for customers who are moving to a new release and want to run both old and new releases together for a time. Before, users had to pay for both versions at the same time. The initial licensing fee was actually increased for Transaction Processing Facility (TPF), although TPF was included in the items subject to graduated pricing.

"They've removed what I've always found offensive: the initial license charge and also the double license fee," said Gabe Goldberg, vice-president of technology at VM Systems Group, a software firm in Arlington, Va. "It looks to me right now it's a wash for us," Goldberg said of the effect of the pricing on his shop. VM Systems Group develops on a 9370 processor in Group 10 and a 4381 machine that falls into Group 20.

While most widely used software became more costly, Cross-System Product, IBM's Systems Application Architecture (SAA) fourth-generation language, saw price cuts in its MVS version of roughly 30% to 50%. In a prepared statement, IBM said its price changes were made to "more closely link software cost to the value received by the customer."

"I was never delighted when they came out with tiered pricing to begin with. We're pretty well stuck along with everyone else," said Jake Jacobstein, vice-president of Financial Technologies, Inc. in Chantilly, Va., a bank service bureau. He said his firm's strategy is to move toward cooperative processing with its clients to limit its exposure to high-end computing price increases.

"Every time we look for more mainframe performance, we pay more for hardware and software," Jacobstein said.

Another user voiced his objections to tiered pricing. "It's very difficult to explain tiered pricing to your upper management," said James Matsey, corporate director of information systems at Reynolds Metals Co. in Richmond, Va.

Matsey said he finds it difficult to calculate a return on a systems investment without knowing the full scope of software costs that will be associated with hardware upgrades.

"We've gotten feedback from customers that it is a fair and equitable strategy," said Susan Whitney, director of SAA marketing at IBM. "We believe that customers are getting value for their software and it does allow us to fuel our software investment stream," Whitney added.

Tasker said that the price hikes are part of IBM's long-term goal to increase software revenue where it can, both by selling more and by charging more. "From a business point of view, IBM did a very good thing for itself," Tasker noted.

"This is clearly not enough to drive the users away from IBM," Tasker said. It will not cause users to drop DB2, he added, and the elimination of the initial licensing fee lowers the threshold for a user buying DB2 initially.

Refac suit goes home to roost

BY RICHARD PASTORE
CW STAFF

The letter arrived last week, addressed to Lotus Development Corp. President Jim Manzi: "Refac has instituted a suit against your company in the Federal Court in the Southern District of New York. . . . We wish to obtain reasonable royalties for the use of the [spreadsheet] technology covered by U.S. Patent No. 4,398,249."

Similar letters went out to five other software companies from the owner of the patent, Refac Technology Development Corp., a publicly held New York-based firm that mainly licenses technology. Refac seeks royalties of 5% dating back six years and hopes to license the technology to all spreadsheet package developers.

Of the firms named in the suit, Lotus and Computer Associates International, Inc. quickly took defensive postures.

"We intend to contest the claim," Lotus Vice-President and General Counsel Tom Lemberg said. "We have absolutely no interest in applying for a license" for the technology, he added.

"I anticipate that the claim will be vigorously defended," said Michael McElroy, CA's general counsel, who is currently investigating the assertion.

The other firms named in the suit — Ashton-Tate Corp., Borland International, Informix Software, Inc. and Microsoft Corp. — refused to comment on the claim.

Based on a preliminary look at the patent, Lemberg said, "The technology described appears not to have been properly subject to patent because it was in use or obvious at the time the patent was applied for."

He added that the technology is too broad-based to have been patented. "Probably no patent should have been granted, but if so, it certainly shouldn't have been for anything this broad," he explained. "In any event, we didn't infringe."

Ashton-Tate counsel Stanley Witkow said he has not yet reviewed the patent. Concerning Refac, however, Witkow said, "I understand that Refac's business is basically buying up patents and going after people."

David Fink, Refac's group patent counsel, disagreed with that characterization. "I'm employed here to license, not to bother people. If it turns out that I was mistaken [about the claim], I'll back off," he said.

Phaser guides Netware toward SNA

BY PATRICIA KEEFE
CW STAFF

SAN FRANCISCO — It's one small step for Netware users but a potentially giant leap for Novell, Inc.'s bid to ease concerns about its compatibility with IBM networks.

Netware will inch closer to integration with Systems Network Architecture (SNA)-based enterprise networks next month when Phaser Systems delivers software said to provide Netware users with access to IBM MVS and VM mainframe services through VTAM-based SNA links. Phaser is owned by Novell President Raymond Noorda.

The two packages — Netware for MVS V2.15 and Netware for VM V2.15 — will eliminate the need to string X.25 lines together to connect geographically dispersed Netware servers. Instead, remote and local-area networks can be linked under existing SNA backbones, said Raymond T. Granvold, Phaser's vice-president of marketing.

Phaser's product strategy for 1990 includes versions of Netware 386 that will include LU6.2 and an IBM Systems Application Architecture/Common Programming Interface for Communications-compatible interface optimized for Netware. "We are really blazing new territory, in that the traditional protocols in IBM mainframe architecture are really oriented toward 3270 activity — mostly terminal emulation or direct terminal support," Granvold said.

In contrast, IBM's newer protocols and LU support are necessary to attain the performance required for Netware-to-mainframe connectivity. "The data stream we get with LU6.2 [supports sending] Netware-type data across the wide-area network," he added. The forthcoming LU6.2 for Netware 386 will complement Novell's LU6.2 for V2.15, which missed its first-quarter 1989 delivery date.

Phaser's technology does not let users utilize the IBM host as a server or peer, but it does allow Netware virtual volumes to be stored at the host and supports host batch processing of LAN-based users' jobs. Those volumes appear as if they were resident on the file server.

SNA communicates with the Netware server by wrapping its SPX packets into an SNA data stream. Phaser's software, which is located on the host, gateway, server and desktop, translates those packets into host commands. Direct VTAM routing enables file and data transfers.

Key applications for the product include electronic software distribution, archiving, backup recovery, data sharing across multiple LANs and network management, said Phaser President John Mullen.

A degree of centralized network management is provided. Initially, Phaser's software will allow access to servers at remote sites for diagnostic or management functions, Granvold said. In the first quarter, enhanced software will allow 3270 terminal users to collect and display LAN-based data on Netview terminals located in a mainframe data center, he added. "You'll also be able to issue Netware commands from that 3270 terminal."

In addition to these features, no memory-resident drivers are required at the workstation for virtual volume access or internetwork bridging, and full host security and accounting facilities are under Netware for MVS.

CA schedules announcement on software updates

BY ROBERT MORAN
CW STAFF

NEW YORK — Computer Associates International, Inc. confirmed last week that it is preparing to make an announcement Aug. 21 concerning new systems software, including software for automated operations and enhancements to its current products.

Sanjay Kumar, the firm's vice-president of strategic planning, would not offer specific details about the impending announcement. However, he did confirm that the company will announce "significant enhancements in the area of automated production control, specifically in automated systems operations for IBM's MVS, VM and VSE [operating systems]."

"There will be lots of new products that were internally developed and never before seen," Kumar added. These reportedly include a security software program and workstation extensions to CA's currently available systems and software products.

The workstation software will not be based on cooperative processing, he said, but "will be [a] revolutionary concept for making our products easier to use and for cutting down the learning curve for end users."

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NEWS SHORTS

U.S. takes inventory

Uncle Sam's arsenal of computer equipment is worth more than $8 billion. So says the U.S. General Services Administration, which got the figures from an inventory of information systems equipment owned or leased by more than 60 federal departments and agencies during the second half of fiscal 1988.

. . . .

Whitney shaves, MAI shifts

Under pressure from its backing banks, J. H. Whitney & Co. last week cut the cash portion of its offer for Prime Computer, Inc. from $21.50 to $20.00 per share. Meanwhile, MAI Basic Four, Inc. amended its offer to buy Prime's minicomputer business for $450 million in cash and $150 million in debentures. The new proposal straight cash — $525 million for Prime's minicomputer operations. Prime reiterated its endorsement of the Whitney deal, smaller size notwithstanding.

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Postal Service makes micro award

The U.S. Postal Service awarded two contracts for microcomputers last week, in the process enabling Apple Computer, Inc. to chalk up its first win as a prime contractor on a government bid. The competitive contracts, worth up to $107.6 million, went to Apple's Federal Systems Group for Macintoshes and Sysorex Information Systems, Inc. in Falls Church, Va., which will supply Everex Systems, Inc. IBM compatibles.

. . . .

Now they're an Apple corps

Apple has also provided the U.S. Peace Corps with an initial grant valued at $216,000 that will provide Macintosh computers for 35 offices located in about half the countries in which U.S. volunteers serve. Software is being provided by Microsoft Corp. and Apple subsidiary Claris Corp. The computers will be used to improve communications between the branches and the home office as well as to manage information better.

. . . .

AT&T to cut emissions

Becoming the first major U.S. electronics manufacturer to commit to eliminating the emission of ozone-depleting chlorofluorocarbon chemicals, AT&T set a 1994 deadline last week for stopping its emissions, even though a spokeswoman admitted the firm could not cut all use of the chemicals by then.

. . . .

No search for Nussbaum successor

Ashton-Tate Corp. Chief Executive Officer Ed Esber said he has no plans to search for a replacement for the firm's former president, Luther J. Nussbaum. A former Businessland, Inc. executive, Nussbaum resigned from Ashton-Tate last month just as a $19.8 million loss was announced for the firm's second quarter. Nussbaum had been faulted by Ashton-Tate insiders for loading Dbase IV inventory into retail channels.

. . . .

Elxsi to halt manufacturing

Buckling under to financial difficulties and facing a substantial loss for the quarter ended June 30, Elxsi Corp. last week announced a massive restructuring that will focus the San Jose, Calif.-based computer systems vendor's resources on support and maintenance and bring its manufacturing to a halt. Chief Executive Officer James Dutton said the draconian reorganization, which eliminated more than half of Elxsi's work force, resulted partly from delays in the company's program to develop the Model 6460 CPU.

. . . .

Norman new Racal-Milgo president

Racal-Milgo, Inc. has announced that Executive Vice-President James K. Norman will replace President Matthew A. Kenny, who will take early retirement this year. Racal-Milgo has been aggressively positioning itself as a full-service communications vendor: This year, it has acquired a fiber-optic network supplier, a local-area network firm and a turnkey satellite systems supplier.

Morris pleads innocent to worm rap

BY MICHAEL ALEXANDER
CW STAFF

Robert T. Morris Jr., blamed for paralyzing thousands of computers on Internet with a worm program, pleaded innocent Wednesday to a felony charge during arraignment before a U.S. magistrate in Syracuse, N.Y.

He was released on personal recognizance. A trial date has not yet been set.

Morris was indicted by a federal grand jury on one felony count for allegedly gaining access to six university and military computers without authorization, preventing authorized access to those computers and causing losses in excess of $1,000, all in violation of the Computer Fraud and Abuse Act of 1986.

The case is the first federal prosecution for a computer virus and the first under a provision of the law that makes it a felony to access a federal-interest computer intentionally without authorization, said Mark D. Rasch, an attorney with the fraud section of the U.S. Department of Justice's criminal division. If convicted, Morris could be sentenced to up to five years in prison and a $250,000 fine and be ordered to make restitution to those affected by the program.

CARL J. SINGLE, *SYRACUSE HERALD-JOURNAL*

Morris *and his attorney in Syracuse, N.Y., after innocent plea*

VAX 6000 generation feeds migration frenzy

BY MARYFRAN JOHNSON
CW STAFF

The rapid-fire rollout of yet another generation of VAX machines from Digital Equipment Corp. is adding fuel to the migration fire at some major DEC workplaces around the nation.

With their greater power, lower prices and easy upgradability, the VAX 6000 machines are chomping at territory once held by DEC's high-end 8000 series.

Managers at several DEC sites contacted by *Computerworld* seemed unruffled by DEC's product blitz and reported no delays in their purchasing plans. Those who had not already started buying into the 6000 line were planning to do so.

"We see what DEC is doing as good news for us. The only thing you have to be careful of is how you march along and keep your investment protected because of the rapid changes in the DEC world," said John McFarlane, computer services manager at Health Net, Inc. in Van Nuys, Calif. His firm will eventually move into the 6000s without giving up the older boxes.

Even the anticipated fall debut of the mainframe-class VAX 9000 — the so-called Aridus or Aquarius machine — appeared to have had little impact on the here-and-now nature of purchasing decisions.

"You don't order into the future on what you think you're going to need," said Richard Leegant, senior vice-president of information services at Comp-U-Card Services in Trumbull, Conn. "You order on the shorter term of what you need now."

At Compu-U-Card, which provides a range of consumer-based services for banks, oil companies and retailers, there are six 8000 series machines at work, a 6000 Model 340 on order and plans already laid to upgrade to the Model 400.

"We haven't waited for anything," said Todd Spirling, vice-president of systems and support at Lotus Development Corp. in Cambridge, Mass. "If you have the luxury of extra capacity, you can wait. But if you're growing, you can't."

After an intensive capacity-planning process last year, the software development firm outfitted two business information systems centers by upgrading three of its 8000 line processors and adding two 6000 Model 200s.

Old but not forgotten

All of the systems managers contacted had major investments in the 8000 series, and no one seemed ready to put the older VAXs out with the trash. There are an estimated 20,110 of the 8000 series machines in workplaces nationwide.

Several users said the only businesses likely to delay a purchase now are those that cannot find what they want in price and performance.

"That's not too many people, these days," said William Brindley, president of Digital Equipment Computer Users Society, or DECUS, based in Marlboro, Mass. "I don't see any slowdown on purchasing at all. You could keep waiting six more months forever."

"Going to the 6000 series is a no-brainer. I'm just adding a [8000] machine to a cluster," said William Anderson, chief information officer for Prudential Bache Securities, Inc. in New York. His department, which has a VAX 8650, 8700 and 8800, has not moved to the 6000 series yet but has budgeted for a Model 440 next year.

Fear of freezing

In the blizzard of new products, some industry analysts were predicting a "frozen-in-the-headlights" reaction from the customer base as new models in the VAX 6000 line came hurtling toward them in six- to nine-month intervals.

"It is unnerving with Digital," admitted James Jordan, a consultant and former senior vice-president at Irving Trust Co. in New York, which has one 6000 Model 200 processor among a family of 8000s. "It gets difficult to freeze on something and say we'll go this way."

Long-range purchasing strategies pose even greater dilemmas.

"How can you have a five-year strategy when every year, the price/performance doubles?" grumbled an IS manager at a major aerospace company.

Another DEC systems manager, who also asked not to be identified, lamented his company's blunder in signing a three-year lease on several 8800 machines. "The minute that the 6300s and 6400s were announced, it was quite apparent we overpaid for the price/performance," the manager said. "Maybe we were asleep at the wheel, but Digital let us drive right off the cliff."

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	Los Angeles	July 20fm August 15m
	Newport Beach	July 18k August 10a
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	San Diego	July 13f
	San Francisco	July 25 August 24
	Santa Clara	July 13fm August 17fk
	Universal City	July 6f
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	Denver	July 20 August 22gk
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DC	Washington	July 13gk August 17g
FL	Ft. Lauderdale	July 14k
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	Orlando	July 12f
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IN	Ft. Wayne	July 12
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KS	Wichita	August 15
KY	Lexington	July 18
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	New Orleans	July 27f
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	Burlington	July 12a August 10g
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ME	Portland	July 19
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	Grand Rapids	July 13m
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	Troy	August 8am
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MO	Kansas City	August 3fk
	St. Louis	July 11fk August 8fm
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NE	Omaha	July 6g
NJ	Asbury Park	August 8g
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OH	Akron	August 24f
	Cincinnati	July 20fk August 17m
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OK	Oklahoma City	August 2fo
OR	Tigard	August 22
PA	Harrisburg	August 15
	King of Prussia	August 15f
	Philadelphia	July 6f
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	Dallas	July 11fk August 1pa
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	Richmond	July 27f
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WI	Madison	August 17f
	Milwaukee	July 25k

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a	Macintosh Networking
f	Oracle Financials
k	CASE/Application Tools
l	Oracle Mail
m	Computer Integrated Manufacturing
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p	PC Product Solutions
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g	Seminars held for Federal Government only
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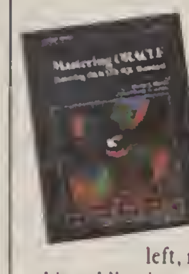

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COMPUTERWORLD

Amdahl follows NAS' cue on ESA stage

BY J. A. SAVAGE
CW STAFF

SUNNYVALE, Calif. — Amdahl Corp. previewed its implementation of IBM's MVS/ESA operating system last week, promising delivery to its lower end mainframe customers in October. Updates for its biggest machines, the 5990s, are scheduled to begin in January.

Amdahl's presentation of Enterprise Systems Architecture (ESA) came one week after a similar exhibition by rival National Advanced Systems. Both companies painted the announcements as a rebuttal to ESA's anointment as the "killer" technology that neither firm could emulate and that would put them out of business. Both firms depend on IBM compatibility to survive, and both spent enormous amounts of money, which neither would quantify, for ESA compatibility engineering.

Even up

"It reinforces that [plug-compatible manufacturers] can match IBM step for step, given a reasonable amount of time," said Bob Djurdjevic, president of Phoenix-based Annex Research. He said that any advantage IBM may have had from offering ESA before its rivals has dissipated because price-slashing in the marketplace has put the companies on an equal footing.

Curiously, Amdahl will have the first ESA upgrades available on its older and less powerful machines, the 5890s. These users are less likely to require ESA upgrades than users of the larger, newer systems.

Chuck Fonner, Amdahl's vice-president of systems marketing, said that ESA will be offered on the older systems first because that group's engineering team was available while engineers were still working out bugs in the new computers.

Vendors and analysts discounted the performance boost to be gained by using the new operating system. Fonner claimed performance actually could decrease by as much as 3% or increase by as much as 7%.

Instead, ESA's attraction is that it allows a different way of managing data that Fonner calls "I/O avoidance." He described it as "allowing DASD to simply store data and relying on electronics to get the performance."

Unlike NAS, Amdahl offered no "extras" with its implementation of ESA. NAS claimed to have added a function that will skip several machine cycles in retrieving information from certain buffers and has also said it will offer bigger Access Register Translation Lookaside Buffers, but it cannot yet quantify any advantages to those functions.

Even those users who do not wish to implement ESA are expected to take advantage of the free upgrades offered by Amdahl and NAS because they will increase the resale value of the machines. Fonner could not say how quickly the firm will be able to provide the upgrades. He said that Amdahl will issue a certain amount to each of four field offices that will be parceled out at the local level.

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Businessland broadens IS training field

BY CHARLES VON SIMSON
CW STAFF

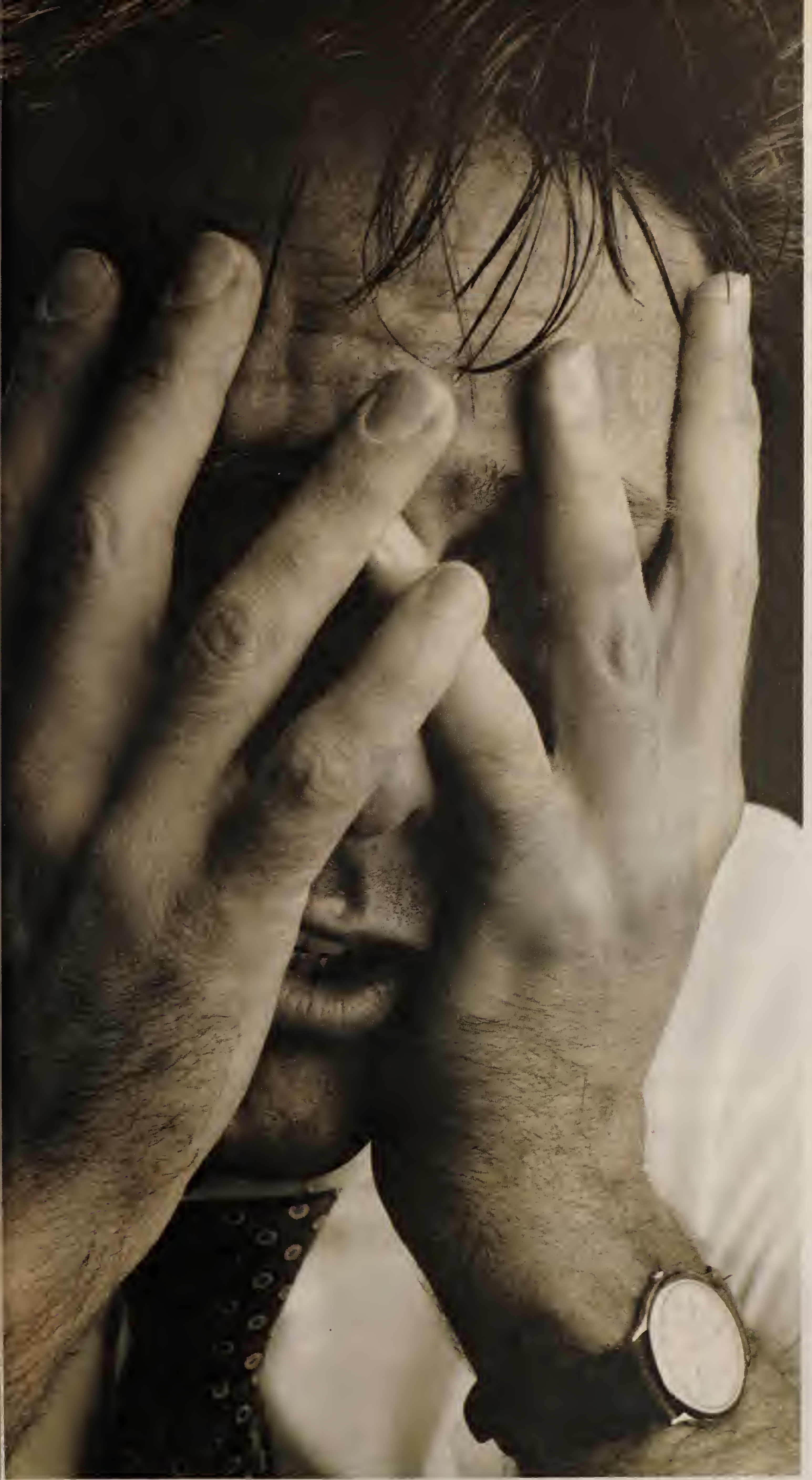
SAN FRANCISCO — With a marketing pitch aimed right at the productivity fears of Fortune 1,000 information systems managers, Businessland, Inc. announced last week that it will expand its end-user microcomputer training program.

Ronald Brown, vice-president of Businessland Services, announced that as part of the training program's marketing effort, Businessland will develop a methodology for measuring productivity before and after its training courses to demonstrate their effectiveness to senior management.

Citing a recent MIT "Management in the 1990s" study stating that in the next decade, senior management will not accept traditional information technology justification, Brown said that productivity measurement would be one of the single most important success factors in systems implementation. "The issue of measuring payoff [of systems] is a hot button," he said.

Undaunted by the fact that definitive productivity measures have eluded a generation of management researchers, Brown said, "We will define what productivity is and how to measure it," in developing the pre- and postcourse tests.

Brown added that Businessland will offer productivity guarantees once the test has been developed. However, he offered no details on the research and gave no timetable for its completion. His comments came as the company announced that it will expand its national IS training program by an unspecified amount. Businessland currently offers 90 general courses at 132 sites nationwide.



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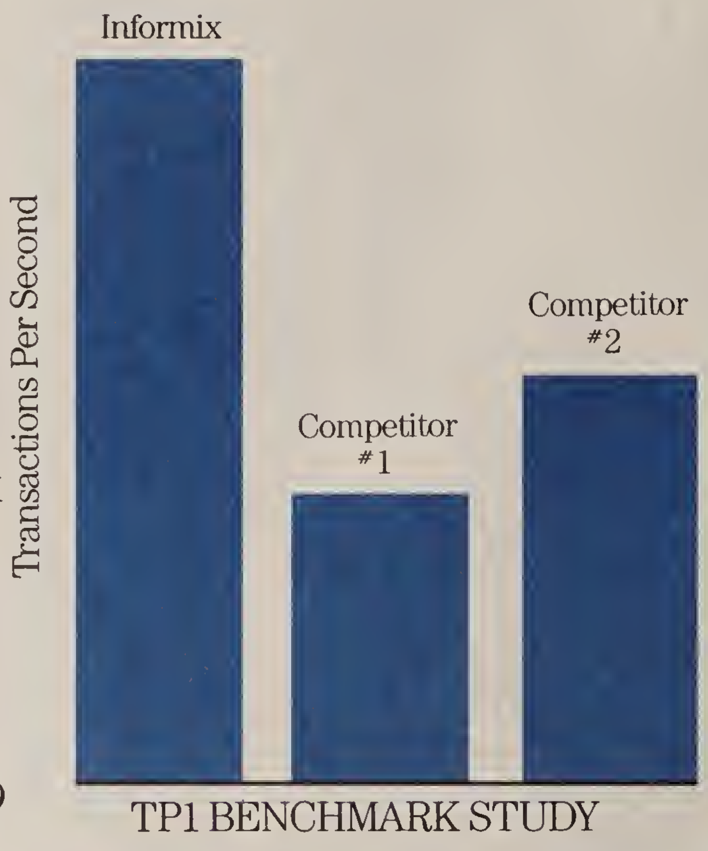

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Stratus rings its way deeper into IBM network scheme

BY ELISABETH HORWITT
CW STAFF

MARLBORO, Mass. — Stratus Computer, Inc. further enhanced its connections to IBM last week, announcing Token-Ring support and closer ties to Netview.

The products are aimed at the significant customer base that uses Stratus' fault-tolerant systems in conjunction with IBM mainframes, vendor spokesmen said. Developed cooperatively by IBM and Stratus as part of the two vendors' OEM agreement, the products will be distributed by Stratus for its System XA 2000 and probably by IBM for the System/88, although IBM has not yet announced this.

Stratus unveiled an enhanced version of Communications and System Management (CASM) software, which IBM originally developed so that Stratus' XA 2000 Continuous Processing System could pass information about attached devices to a Netview host. Enhancements included the following:

- Two-way communications between Stratus and Netview hosts, enabling attached devices to receive Netview commands as well as send alerts up to Netview via the Stratus connection.
- The ability of an XA 2000 to replace Netview/PC, allowing Netview users to fully understand what is happening downstream to non-Systems Network Architecture devices, according to Anthony Cyplick, communications product manager at Stratus. CASM originally supported only SNA devices.
- The ability to send alerts to multiple Netview hosts. This feature addresses a growing population of users who have distributed management functions among different IBM systems — for example, having each host manage a different region or type of application, Cyplick said.

Stratus also announced an interface that is said to allow the XA 2000 to communicate over a Token-Ring using IBM's Advanced Program-to-Program Communications.

Stratus' Token-Ring support is of great interest to Central Bank of the South, according to Tom Brander, senior vice-president of data processing at the Birmingham, Ala., company. The bank is currently evaluating the idea of implementing Token-Ring corporatewide as a "common communications medium" for automated teller machines as well as IBM, Stratus and Tandem Computers, Inc. hosts and eventually for Novell, Inc. servers, Brander said.

A system of Token-Rings with redundant interconnections could potentially eliminate the need for Stratus systems to reroute ATM transmissions around downed lines, leaving them more power for applications, Brander said.

Additional Stratus introductions for the XA 2000 that were not jointly developed with IBM included support for Transmission Control Protocol/Internet Protocol (TCP/IP) and Sun Microsystems, Inc.'s Network File System (NFS). Also announced was a channel attachment said to allow XA 2000s to act as network concentrators, consolidating terminal connections over a single 1.5M byte/sec. link to IBM hosts, Cyplick said.

While IBM has the right to sell "anything we manufacture under our OEM agreement," the firm has not yet announced any plans to distribute the above products, a Stratus spokeswoman said.

Starting prices are $1,870 for the new CASM version; $24,350 for the Channel Attach Subsystem; $3,740 for the Token-Ring connection; $3,400 for NFS; and $875 for TCP/IP software.

Strategic systems

CONTINUED FROM PAGE 1

merger of the computerized reservation systems (CRS) of American Airlines and Delta Air Lines on grounds that it would lessen competition both in the sale of CRS services to travel agents and in the airline industry in general [CW, June 26].

That was the latest in a still-evolving saga of antitrust actions against the CRS services, including federal regulations, a pending antitrust lawsuit pitting smaller carriers against American Airlines and United Airlines and congressional threats of divestiture [CW, Dec. 14, 1987, and Sept. 19, 1988].

Late last month, New York and 11 other states filed suit against Mastercard and Visa, charging them with a conspiracy to monopolize the point-of-sale network industry to prevent debit cards from emerging as a competitive threat to their profitable credit card operations. The firms denied any antitrust violations.

Antitrust suits — which can be very debilitating and can lead to triple monetary damages — usually focus on efforts to create or sustain monopolies, unfair competition, price fixing or actions that create barriers to entry into the market.

"If an application is replicable, then there is no competitive advantage. If you can't copy it, the question is, does it come under restraint of trade?" said Peter G. W. Keen, executive director of the International Center for Information Technologies in Washington, D.C.

However, as one lawyer put it, "It is not a violation of antitrust law to work hard, to work smart and win more market share . . . if you are competing in a fair manner."

Attorney Marx

What constitutes illegal conduct depends on the facts of the individual case, but experts said the clearest example was the display bias in the original CRS services provided to travel agents. In 1980, the federal government found that American and United had biased the displays of airline listings to favor their own flights and failed to load data about other carriers into the database in a timely manner.

In the Visa/Mastercard case, the states said the alleged conspiracy to stifle competition had two parts. First, Visa and Mastercard jointly formed a point-of-sale network for debit cards in 1987 called Entree, but the 177 member banks never got around to signing up any merchants to participate. Second, Visa and Mastercard acquired control of three companies that had planned to offer point-of-sale networks using debit cards, thus eliminating competition for either Entree or their credit card operations, the states charged.

Antitrust cases have been on the back burner at the federal government for many years now, and no one has claimed that antitrust issues are more important in developing strategic systems than ideas, technology and implementation.

However, IS executives need to be aware of antitrust implications when they form joint ventures or industrywide consortiums, said Eric Clemons, associate professor of decision sciences at the University of Pennsylvania in Philadelphia.

Years ago, strategic systems were built by pioneers who surprised their competitors. Now, "it's pretty rare for your competitors to just sit back and let you make a preemptive strike," so companies are turning to joint ventures and consortiums to reduce costs and risks, Clemons said.

Clemons, while not condoning the Visa/Mastercard venture, argued that cooperative projects provide important economies of scale and are not necessarily anticompetitive.

Marx said that one technology that would be vulnerable to antitrust abuse is electronic data interchange (EDI) — if a single EDI network became dominant in a particular industry and barred some firms from joining. If the EDI network was deemed an "essential facility" in that industry, antitrust laws could force the network's proprietors to provide open access to all comers. However, Benjamin Wright, a Dallas-based attorney specializing in EDI law, said no abuses of EDI have been reported so far and he doubts EDI will ever become an antitrust problem.

Antitrust concerns also could be raised if a company uses its on-line information service to discriminate against certain firms, said J. T. Westermeier, a partner with the law firm of Fenwick, Davis & West in Washington, D.C.

"There's no question that there are going to be more and more concerns about antitrust," Westermeier said, "because we're dealing with a world where on-line databases and systems are used for decision making."

By the rules

Antitrust regulations limit how much of a competitive advantage strategic information systems can provide

- "Every contract, combination . . . or conspiracy in restraint of trade or commerce . . . is hereby declared illegal." — *Sherman Antitrust Act, 1890*
- "No person engaged in commerce shall acquire . . . another corporation where the effect of such acquisition may be substantially to lessen competition or to tend to create a monopoly." — *Clayton Antitrust Act, 1914*

CW CHART

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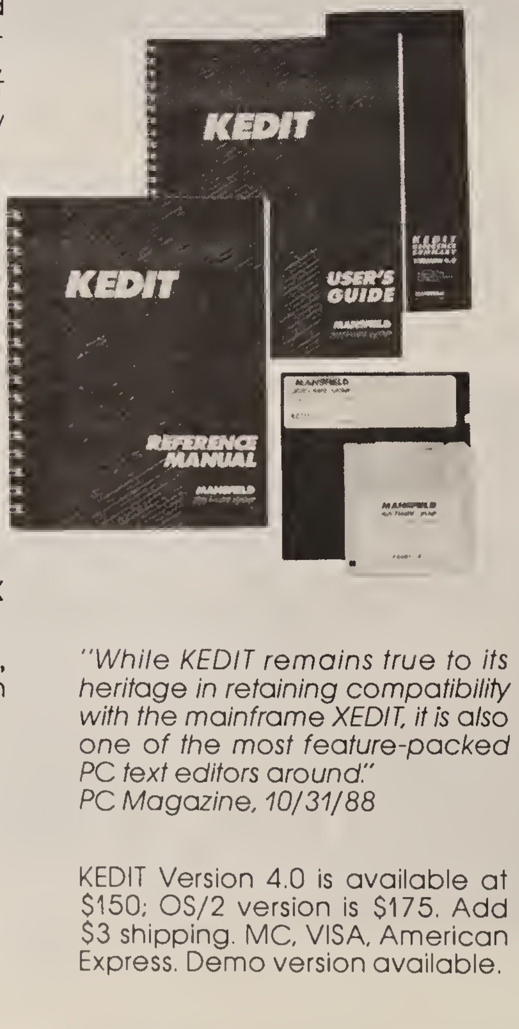

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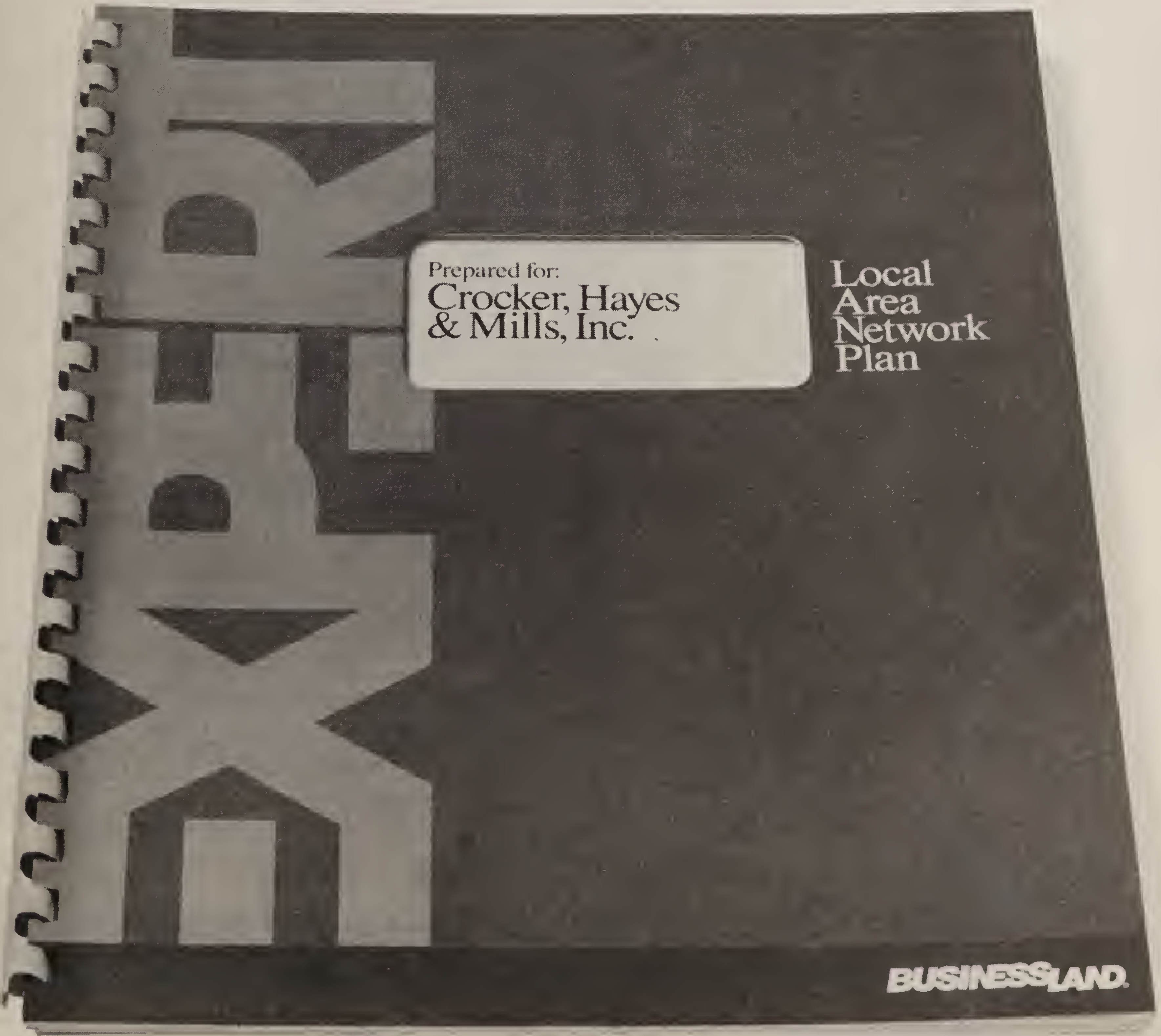

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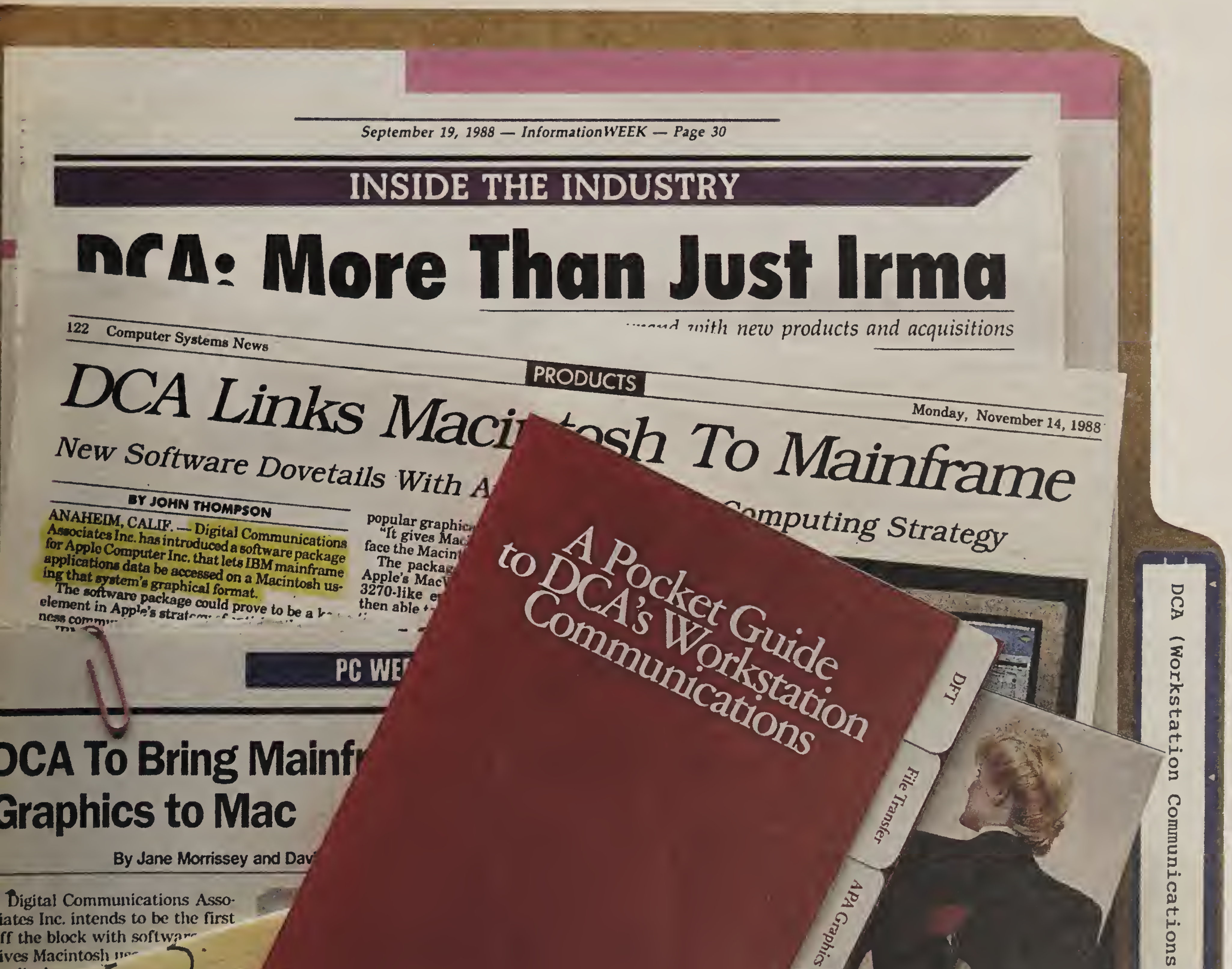

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INSIDE THE INDUSTRY

DCA: More Than Just Irma

...with new products and acquisitions

122 Computer Systems News

PRODUCTS

Monday, November 14, 1988

DCA Links Maci... To Mainframe

New Software Dovetails With A... Computing Strategy

BY JOHN THOMPSON

ANAHEIM, CALIF. — Digital Communications Associates Inc. has introduced a software package for Apple Computer Inc. that lets IBM mainframe applications data be accessed on a Macintosh using that system's graphical format.

The software package could prove to be a k... element in Apple's strat... ness comm...

popular graphic...

"It gives Mac... face the Macin...

The packa... Apple's Mac... 3270-like e... then able t...

PC WE...

DCA To Bring Mainfr... Graphics to Mac

By Jane Morrissey and Dav...

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Cincom users loyal but unhappy with support

BY STANLEY GIBSON
CW STAFF

ORLANDO, Fla. — Amid questions that its recent financial stumble is a symptom of a larger malaise among independent software vendors, customers of Cincom Systems, Inc. expressed loyalty to the firm's products last week but complained about a falloff in support.

Some users among the 700 attending the annual Cinteract meeting here said support had deteriorated after a personnel reduction earlier this year.

As part of an economy drive that began in April [CW, March 27], Cincom mandated one month of unpaid leave for all employees. That measure was one of a long list of moves designed to keep costs from growing beyond revenue.

"Support is lacking, but it was lacking before the financial problems," said Patricia Proft, database administrator at Ball Aerospace Systems Group in Denver. She said that Ball has problems that first cropped up in February and are still unresolved.

"I wanted to laugh when [Cincom President Tom] Nies said support was excellent," Proft said, adding that her support person left one month ago.

Sue Smith, also at Ball Aerospace, complained that in addition to the manpower shortage, software patches have been unsatisfactory. "We've been getting patches that haven't been tested," Smith said.

"The [Cincom support] office in the Seattle area is small. The staff has been topsy-turvy with the one-month leave of absence," said a user from a lumber processing firm in the Northwest.

Despite gripes about support, nearly all users voiced confidence in Cincom's technology and their preference for Cincom products over those offered by competitors.

Restructuring

Cincom officials did not directly address questions about the privately held firm's financial status at general meetings, but they did describe a corporate restructuring that is intended to reduce middle management and keep costs down. Part of the restructuring means that sales reps will be dedicated to only certain products, rather than selling the entire Cincom portfolio.

Tom McLean, vice-president of marketing and product planning, said Cincom's sales are continuing to grow from last year's total of $161 million and should be $175 million to $180 million for the current fiscal year. With those sales, Cincom will achieve a profit, McLean asserted.

In some cases, personal conversations with Cincom officials about the firm's long-term prospects have assured users there is no cause for alarm.

One user pointed to Cincom's ability to weather storms in the past. "They've gone through this before. They pulled through fine. I'm not worried," said Craig Lincoln, manager of data processing at Star Cutter Co., a maker of metal-cutting tools in Farmington, Mich.

Down the road

At its annual meeting for users last week, Cincom announced Release 6.4 of Control, its manufacturing software, which includes distributed multisite material management. Control will gradually become compliant with IBM's Systems Application Architecture (SAA), according to officials.

Cincom executives also announced the following product information at the users meeting:

- A future release of Cincom's Supra relational database management system will allow relational access to files residing under IBM's IMS database management system. The enhancement is currently in beta testing.
- The Unix version of Supra is now shipping.
- Cincom's Manage office automation package is about to be released in a Unix version, so that Manage will be able to integrate electronic mail in IBM, DEC VAX and Unix environments.
- To align with IBM's SAA, Cincom will add support for SAA's Common User Access (CUA) to Mantis; an OS/2 version of Mantis is in the works, and Mantis eventually will work in a cooperative processing mode with IBM hosts and workstations.
- Supra will have SAA Common Programming Interface "for the life of the product."

McDonnell Douglas net services sold

BY RICHARD PASTORE
CW STAFF

ST. LOUIS — McDonnell Douglas Corp. announced last week that it will sell its network systems business, including Tymnet and EDI*Net, to British Telecom, Inc.

The proposed sale, for an estimated $355 million in cash, will free McDonnell Douglas to direct more resources to its core aircraft business.

However, just as important, it creates a major foreign-based player in the U.S. networking marketplace, according to Charles Federman, a partner at consulting firm Broadview Associates in Fort Lee, N.J.

Its purchase of the Tymnet public network operation and the EDI*Net electronic data interchange service — with total annual revenue of about $250 million — "makes British Telecom one of the major data carriers in the U.S.," Federman said.

Tymnet services 3,000 users, including more than one-third of the 100 largest U.S. corporations.

Look out, AT&T

"The one who I think really has to sit up and take notice is AT&T," Federman said. AT&T last month won U.S. court permission to expand its limited role in information services in the U.S.

In Europe, he noted, it will take AT&T years to carve a niche equivalent in size to the one British Telecom has just staked out in the U.S.

Because this is British Telecom's big U.S. gambit, it is likely to put its best foot forward for current customers of Tymnet and EDI*Net, according to David Taylor, an analyst at research firm Gartner Group, Inc.

"There should be no loss of service or negative impact," Taylor said. "I expect at some point it will give users additional reach into the European marketplace."

Selling at a high

The information systems business segment of McDonnell Douglas is in the black so far this year — the first time in the last five years

Year	Revenue	Operating income (loss)
1989 (first half)	$559M	$9M
1988	$1.3B	($76M)
1987	$1.2B	($42M)
1986	$1.2B	($70M)
1985	$1.1B	($109M)

CW CHART: JOHN YORK

In addition to the network systems divestment, McDonnell said it plans to sell its North American field-service division, which offers computer repair service for a broad range of platforms. The field-service division operates 150 U.S. offices and employs some 970 people.

In addition, the company said its U.S. computer systems business will become part of its Information Systems International arm. The international operation itself will be reorganized into a UK-based public company and is slated for partial divestment.

The divestments and restructuring came as no surprise to McDonnell watchers. "The aircraft manufacturers in general have been divesting their information services businesses," Federman said. "Their business base — airplane making — is going beyond expectations; they all have record backlogs."

In contrast, McDonnell Douglas Information Systems Co. — consisting of network systems, computer systems, international systems and systems integration divisions — has dropped nearly $300 million in the last four years.

Ironically, however, the company earned a $9 million profit in the first half of this year — its first such profit in six years (see chart).

"We are beginning to prove we can be a viable force in the information systems industry," President Jeremy Causley said in the earnings announcement three weeks ago. Causley is slated to become chief executive of the reorganized UK firm.

The aircraft maker said that it will maintain and increasingly emphasize its $400 million systems integration business.

TOPS revamps high-end server plans

BY PATRICIA KEEFE
CW STAFF

The TOPS Division of Sun Microsystems, Inc. detailed a year's worth of plans designed to overhaul its distributed server architecture last week in an effort to support the high-end desktop strategies of IBM, Microsoft Corp. and Apple Computer, Inc.

The newly autonomous unit of Sun is looking to make its namesake software "the equivalent of 1-2-3 on the desktop," according to Richard Shapero, division vice-president and general manager.

At the same time, TOPS' product diversification and recently regained control over its helm is expected to shield Sun from appearing to talk out of both sides of its mouth — that is, pushing both Unix and OS/2.

To achieve all that, TOPS will have to recast its peer-to-peer, low-cost network in a more sophisticated mode. This would enable the company to ride the next wave of network computing, which analysts predicted will highlight both ease of use and interoperability.

The TOPS network now supports DOS, Unix and Xenix, with a user base of about 600,000. Shapero outlined a 1990 delivery schedule last week designed to extend that support to the following platforms:

- Two new products will operate under Microsoft Windows 3.0, providing filing, messaging and printing services — TOPS for Windows and Inbox for Windows. They are slated to ship in the first quarter.
- Using TOPS' Flashtalk protocols, the Flashcard/MC network adapter for IBM Personal System/2s and compatibles links the Micro Channel Architecture with Apple's Localtalk. Positioned as an alternative to more expensive and higher speed Ethernet and Token-Ring options, Flashcard/MC also gets a first-quarter nod.
- TOPS' complete product line will offer full compatibility with Apple's Appletalk 2.0, Tokentalk and System 7.0 operating software by the second quarter, assuming Apple meets its own delivery dates.
- OS/2 users will reportedly be able to share files with TOPS networks and exchange messages with Inbox mail sites using TOPS for OS/2 and Inbox for OS/2, both available in the fourth quarter.
- Two gateway enhancements to the Inbox mail package will allow users to interconnect with Unix Mail and IBM's Professional Office System mail. These are set for fourth-quarter delivery.

By the end of 1990, TOPS users should be able to connect Unix, DOS, OS/2, Windows or System 7.0 systems, whether running over IBM Personal Computer AT or Micro Channel buses or Apple or Unix workstations, Shapero claimed.

"It's a fair assumption that TOPS will be implemented under Open Look," he said, referring to Sun's plans to support AT&T's graphical interface.

West Coast correspondent James Daly contributed to this report.

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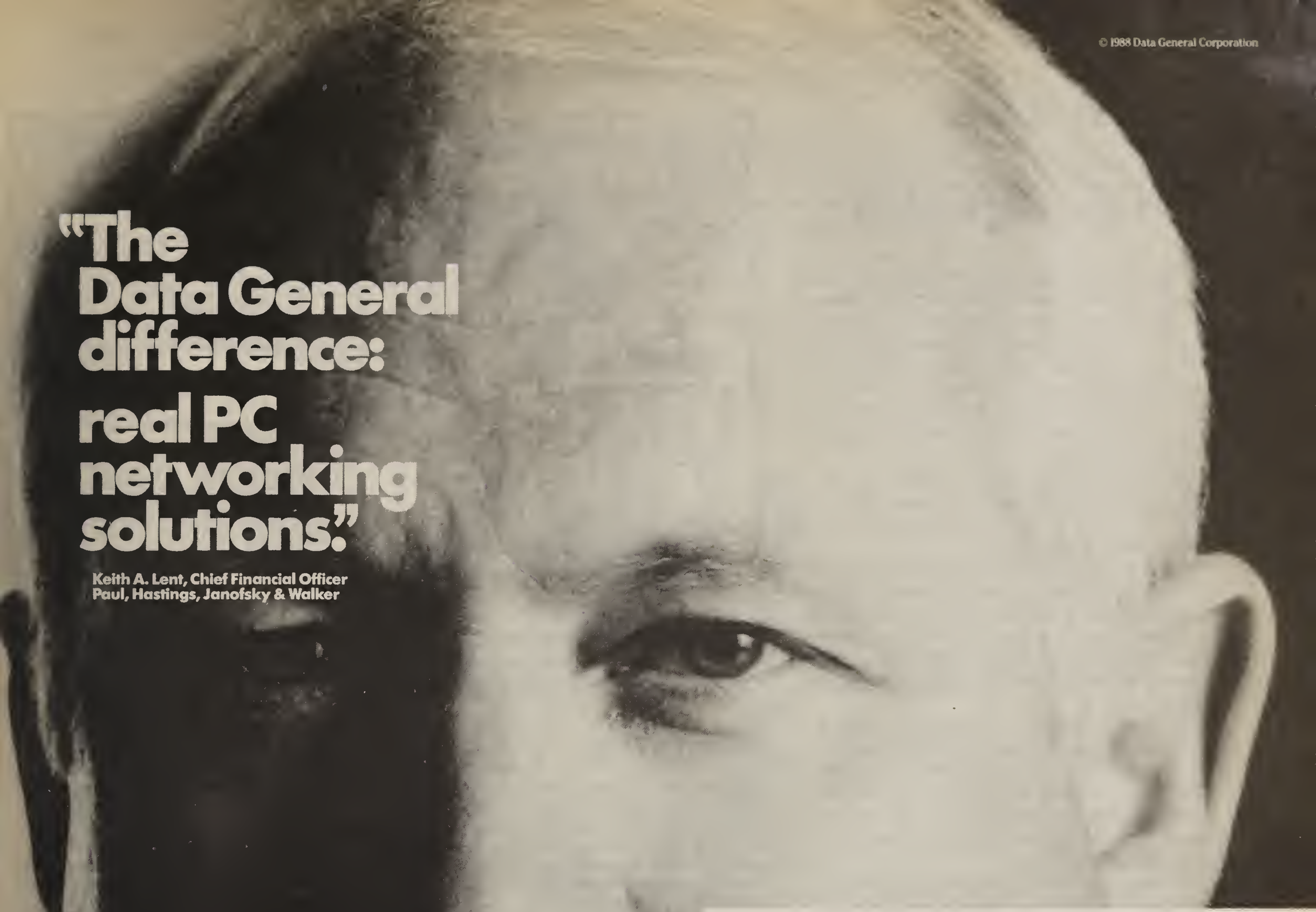
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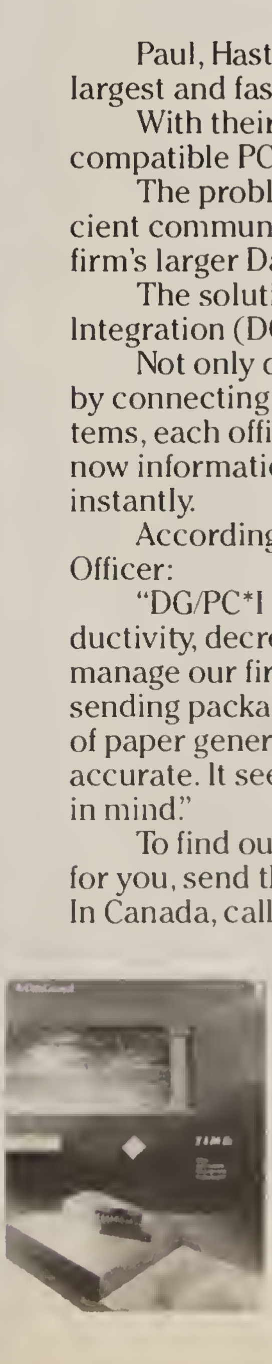

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EDITORIAL

Drive carefully

BACK IN THE early 1980s, production problems caused IBM to slip its delivery schedule for the 3380 series disk drive.

So, storage-starved users flocked to Storage Technology, which had cloned the 3350 drive IBM was supposed to replace and which IBM had stopped making. As a result, Storage Tek rocketed to the Top 10 of computer companies based on sales.

Eventually, however, IBM rolled out the 3380, and shortly thereafter, Storage Tek entered Chapter 11 bankruptcy protection (from which it has since emerged).

Apart from highlighting the computer industry rule that fortunes rise and fall with shocking suddenness, this experience also demonstrated the tremendous resiliency of IBM to overcome critical mistakes and, over the long haul, carry on in its most important market segments without a major hitch.

But that was nearly a decade ago. Late last month, users got the bad word from Armonk that the ship date for the much-anticipated 3380 follow-on will be delayed indefinitely. This news came despite recent assurances to certain customers of an early August delivery, according to International Data Corp.

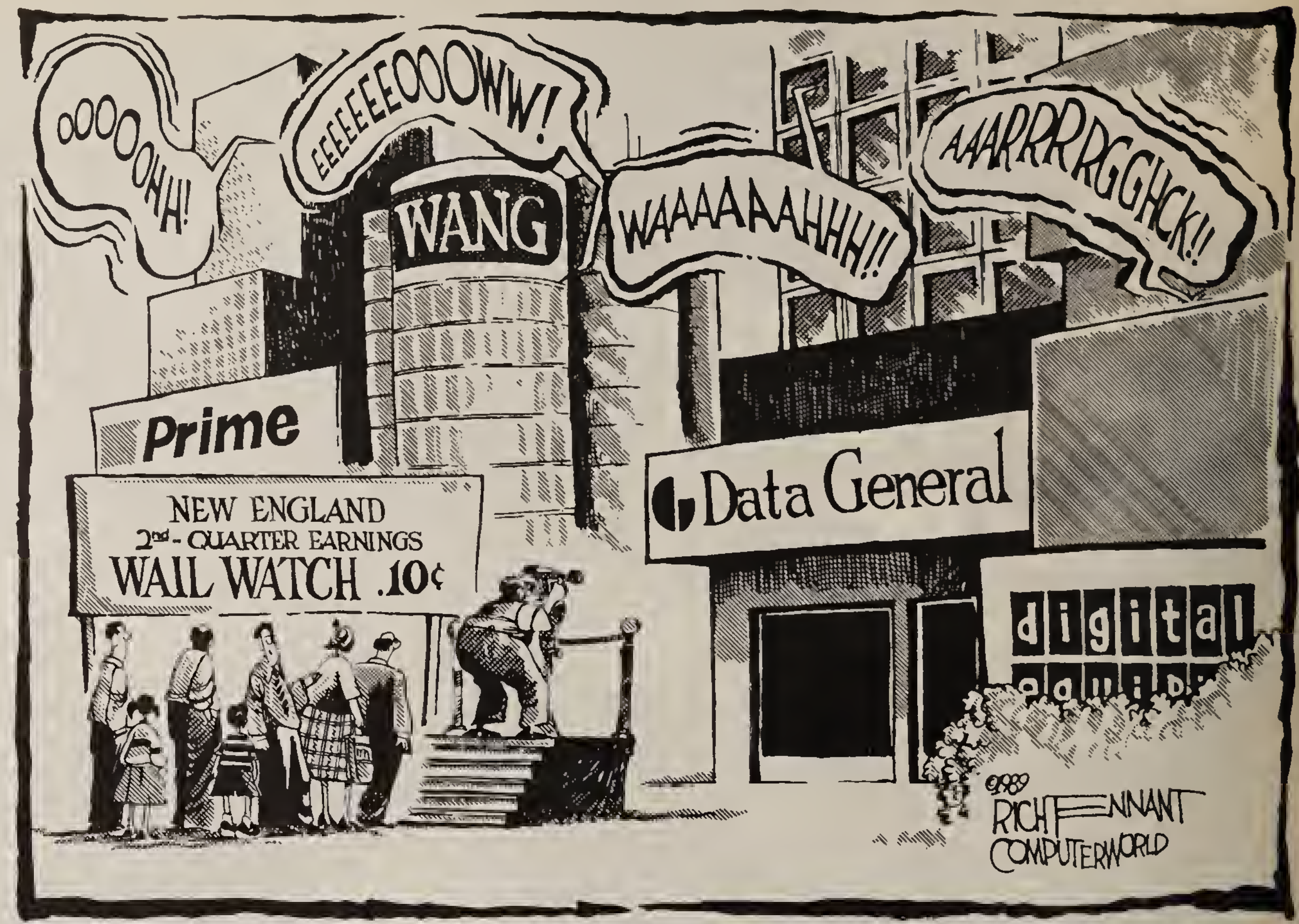
Apparently, it was more than the customer base that was given such assurances. Research houses had been advising clients to put off buying the high-end 3380 K-class drives from IBM. In fact, some customers had cut leasing deals for used 3380s that they anticipated would be available once the follow-on was shipped. Those deals have been scrapped, and the price of used 3380s has shot up.

The IBM announcement prompted the Gartner Group to immediately advise its clients to buy the K-class drives because that is all that will be available for now.

If IBM looks at this situation as a sort of deja vu, it may be wrong. The competitors this time looking to mop up the lucrative large-scale DASD market are the Japanese, such as Hitachi, Fujitsu and NEC through U.S. conduits Amdahl and National Advanced Systems. Further, the customer base this time around may not be as amenable to being jerked around as it once was (see column, page 23).

IDC, which had forecasted a shipping window stretching from July through next January, is now advising clients of the following course of action in light of the recent news:

- Despite a favorable negotiating climate, beware of J and K models made before Sept. 1988 because they have a greater potential for HDA problems.
- Beware of 20% to 30% price inflation in the short term on used 3380s.
- Seriously entertain plug-compatible vendors.
- Look for general availability of the 3380 follow-on in the fourth quarter of this year.
- Consider a full System Managed Storage configuration before going to the 3390/3990 controller combination.



LETTERS TO THE EDITOR

Price increase

Regarding the In Brief story called "Oracle pinnacle" [CW, July 17]: Oracle Corp. loves the fact that its growth rate has been over 100%. The fact is its product and service prices have increased drastically over the past two years.

When I first purchased Oracle in April 1987, the price of the package was $25,000. Today, if I were to buy the same product, it would cost $49,910. This is an increase of over 98%. Support costs in 1987 were at 12.5% of the initial cost per year. Today it is at 25%.

So now you can see why Oracle has such a high percent growth. I would like to see the actual growth in sales and not sales dollars.

Craig Wasielewski
MIS Manager
Dunhill Personnel System, Inc.
Carle Place, N.Y.

Power of the press

Regarding "Freedom is: No more hype" [CW, July 3], I wholeheartedly agree with William Brandel in his assertions against the major manufacturers who bludgeon consumers with preannounced vapor products.

What Brandel fails to see is that he is just as responsible for this problem as the companies that make these announcements. If *Computerworld* had a policy of not publicizing these kinds of announcements, or at least moving them off of page 1, then we would probably notice a great reduction in this sort of vapor wordplay.

Finally, advertisers and consumers should take their responsibility to heart and stop advertising in or purchasing the magazines that will print whatever "Big Blue" is spewing this week. Computer manufacturers, media and advertisers are all looking for the quick buck; it is the consumers who pay for their lack of integrity.

Jim Schwarz
Programmer/Analyst
Freeman Chemical Corp.
Port Washington, Wis.

Reciting the facts

"Dbase eyed for wider Unix role" [CW, July 3] implies that Recital Corp. and Fox Software, Inc. are affiliated in some manner. We have the highest respect for Fox Software; however, we have not joined forces with them to beat Ashton-Tate to the punch with Unix and VAX/VMS versions of Dbase. Recital, the only full-function Dbase-type language available for the Unix and VAX/VMS environments, has accomplished this feat alone, and all 500 installed systems referred to in the article are Recital customers.

The fact that Ashton-Tate is talking about pursuing this market only validates the already widespread requirement for moving the Dbase language to the Unix and VMS environment.

Charles W. Skamser
Executive Vice-President
Sales
Recital Corp.
Danvers, Mass.

For the defense

I found the technical analysis and the lawyer-bashing comments in J. A. Savage's column "Looks, feels like trouble," [CW, June 12] naive and gratuitous.

She states that ". . . computer companies should draw their profits from how well the hardware and software work, not on what they look like." The look of the software is a major factor not only in how well it works but in how well it sells.

As for the analogy to a columnist trying to copyright the way a column looks (in an attempt to illustrate the foolishness of protecting the look of software), she should probably review the recent actions of *USA Today* in protecting its format from duplication (in a company's annual report). If there were anything unique or original about Savage's column format, it, too, would probably be afforded protection for its "look."

Additionally, Savage places much of the blame for the litigation over graphical interfaces on lawyers, "who will make a profit either way." What a refreshing and intellectually honest position! Finally, someone is not afraid to speak out on behalf of the poor, beleagured CEOs and boards of Microsoft, Apple, Xerox, HP, et al., who have been relentlessly bullied by their attorneys into filing these lawsuits. After all, it is the nature of American capitalist enterprise to band together and cooperate, so that every company may share profits on an equitable basis (the bygone "era of cooperation" that Savage recalls?).

By the way, what's wrong with lawyers making a profit?

Philip D. Summer
Attorney
Seattle

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

Learn a market strategy lesson

WILLIAM D. HARRISON

Late on a Friday afternoon in the fall of 1971, two senior-level employees in the RCA Computer Systems corporate information systems department were about to head home. While walking down the main hallway, they saw a senior manager with his head pressed against the wall. As they approached him, he began to pound on the wall with his fist.

At first they thought he was ill, and they asked him if there was anything they could do to help.

Without turning around, he handed them a piece of paper he was holding. It was a telex that stated, "RCA Corp. announced it will withdraw from the commercial computer business at the close of business today."

In shock and disbelief, the two managers continued walking down the hallway. Both had worked at RCA's Computer Systems Division for many years, and the news was stunning. Most of the employees learned RCA was closing the Computer Systems Division when it was announced on NBC's news program that same day. Later that evening, the corporate director of IS telephoned each member of his staff and told them he wanted to meet with them at his home the following morning.

The IS director did not have any additional information regarding the closing of the division, but he was determined to keep morale high and have a sense of order prevail.

Over the next few weeks, the IS director assigned his staff to assist people in writing resumes and providing references. He also developed a system of volunteers for layoffs.

There were many rumors concerning which companies might buy all or part of the RCA division.

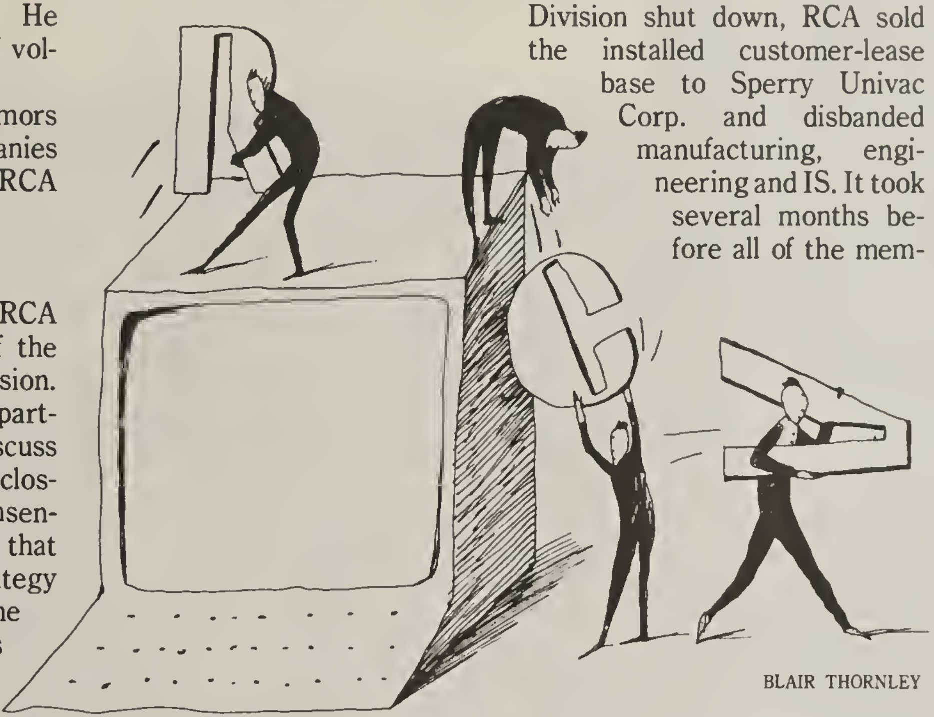
Absurd strategy

It took several months for RCA to complete the closing of the Computer Systems Division. The members of the IS department had ample time to discuss the problems that led to the closing of the division. The consensus of the department was that the division marketing strategy was, for RCA, absurd. The marketing strategy was simple but deadly: "Make machines that are IBM-compatible, and someone will buy them."

This contrasted with what had been a viable marketing strategy in the mid-1960s. Long before RCA was in the computer business, it was in the communications business. It was assumed by everyone at the company that RCA's computers had to be superior to the competition's in the area of communications.

The last computer system that RCA built prior to embarking on its IBM-compatible product line was the RCA 3301. The RCA 3301 was a very good business machine, but it was an outstanding data communications processor and was chosen for several military projects.

RCA had a de facto strategy based on communications and was on its way to being recognized as the leader in data communications processors.



BLAIR THORNLEY

Then one day, the sky fell. IBM had sold many 1401 processors and had not provided an adequate upgrade path. Honeywell saw a marketing niche and capitalized on it. Honeywell achieved instant success by introducing a 1401-compatible machine.

Managers at RCA were very impressed with Honeywell's success, and they concluded that if a little bit of IBM compatibility was good, a lot must be better. Though this worked well for other companies years later (i.e., the PC clones), it was disastrous for RCA. Suddenly, a viable marketing strategy was replaced with a facade of a marketing strategy.

After the Computer Systems Division shut down, RCA sold the installed customer-lease base to Sperry Univac Corp. and disbanded manufacturing, engineering and IS. It took several months before all of the members of the IS department found suitable positions.

What happened at RCA in 1971 offers lessons that apparently still haven't been learned today. Look at the list of major computer vendors that have given in to acquisition or are seriously floundering because they lost sight of their marketplace. Companies such as Honeywell, Data General, Wang, Prime, Cullinet, Apollo and many others have seen their glory fade quickly.

Today there are many skilled IS professionals that are in a similar situation. The corporate takeovers usually result in a surplus of IS staff. The result is an era of consolidation, mergers and acquisition. Success achieved by formulating smart and aggressive marketing policies has been replaced by instant growth through absorbing other companies.

In many instances, the corporate takeovers appear as mindless and unimaginative as RCA's strategy of IBM compatibility.

Taking risks

It is becoming common for companies to be placed in high-risk positions by incurring a large debt because of a corporate takeover. These companies could face economic problems if interest rates increase significantly.

The former corporate director of IS at RCA Computer Systems Division made it a practice to keep in touch with his staff from RCA. Last month, he became concerned when he could not contact one of them. This employee had worked at RCA for 12 years before he was laid off. He then found employment in the IS department of a semiconductor company and worked there for 17 years.

Last month, he was told that he was being laid off again. His company had been purchased, and there was a surplus of IS programmers.

Harrison is a free-lance writer and consultant based in Gainesville, Fla.

Be true to the schools: Give industry updates

JOHN BARNES

At the end of the recent school year, I spoke to a couple of honors-level classes at local high schools about where the computer industry is going. They seemed to listen whenever I talked about money.

I was surprised to find that although more than half the students had taken more than a year of computer science and almost all of them had personal computers in their homes, not one had heard of AI, graphics supercomputing, expert systems, LISP, massively parallel processing, RISC or Ada.

A few knew what LANs, CD-ROM and object-oriented languages were. Many of them seemed to think that "EDP" was an insider buzzword and that when they got to college, the first thing they would need to learn was Fortran.

Further, my short crash course on industry news — necessarily incomplete because I only had a few minutes and was going from the top of my head — was almost as unknown to the instructors and guidance counselors as it was to the students.

Behind the times

There are reasons for this. Unfortunately, most school districts go several years between buying textbooks, and it takes about two years to write and produce a textbook. So in a district with a tight but not impoverished budget, the information in student textbooks is typically outdated by three to 10 years.

This is not a big problem in Latin or even in American history or mathematics. However, in computer science classes and career guidance, it's a disaster. I can't fault any of the instructors I met. They were bright, fairly well-read people. But they were basically math teachers — computer science was strictly a sideline.

Similarly, the guidance counselor is usually a catch-all administrator and social worker who is somehow supposed to know about *every* industry and academic discipline. You can't give people impossible jobs and then complain when they fail to do them.

In five or six years, you will be hiring some of these kids. College will catch them up somewhat, but not nearly enough.

Politically, it's imperative that the high-tech industries do more to keep American kids competitive.

Many companies have cooperative ventures going with their local schools. More should. The following are some other innovative ways, culled from newsletters, interviews and educator suggestions, in which your department or firm can improve the quality of computer education.

These programs cost money and time, but they are tax-deductible. If every company does its share, the following programs need not be expensive:

- Update your local high school's textbook collection. The price of an IBM PC AT with a laser printer would buy more than enough books for most schools.
- In addition to college students, why not hire some math teachers next summer? Many teachers spend their summers painting houses or driving ice cream trucks. Why not create an internship that will let them learn about the real needs and frontiers of computer science? Incidentally, by paying them more than they'd make in other jobs, you'll help keep them teaching (where they're sorely needed).
- Talk to people in your local information systems association or business groups. Chances are that at least one company in your area is already doing something for the schools. It may be possible for your company to extend a good program to more schools or to expand a program already in place, while incurring almost no additional administrative overhead.
- Could you spare each of your people from one staff meeting per year? In that time, they could visit a local high school and talk to a group of students, teachers and counselors about the current state and prospects of the industry. A few such visits per year could give everyone in the schools a current, realistic perspective on the computer industry.
- Do some of these things for schools in the less affluent districts. It's politically sensible and far more likely to make a difference. The suburban kid who rides to computer camp in the back of Dad's BMW will be employable in the computer industry regardless of what you do. However, if you enable one kid in the inner city to attend a community college in a tech speciality, you've truly changed a life for the better.
- Buy a subscription to a good source of industry news for the local high school or college library, or let them have your old copies.

Naturally, you and your company will not have time to do all these things. But if every sizable computer-industry corporation and every large IS department did just one of them, think about how easy the task of hiring could be in just five years.

Barnes is Northwest-area manager of ADG, a high-tech marketing company based in San Pedro, Calif.

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SYSTEMS & SOFTWARE

HARD TALK

Rosemary Hamilton

Disk-drive duplicity?

If IBM isn't very careful over the next few weeks, it might end up with a credibility problem among its large system users.

The company let us know late last month that its new disk drive, commonly known as the 3390, would be delayed because it didn't pass internal testing. It didn't tell us what the problem was, however, and it didn't let us know when it could introduce the new product.

IBM should rethink this decision not to explain exactly what's going on here. Users are getting nervous, and straight talk would ease their minds a bit. What IBM needs to do now is let users know what the technical problems are and how soon they can expect a reliable product to ship.

If IBM leaves us with a vague statement about how the 3390 didn't pass "extensive, rigorous testing," then folks might start to wonder what exactly is going on and if IBM is hiding something. That likely would not have been the case if the cancellation were an isolated event. Users might have accepted the way IBM elected to

Continued on page 29

RDB crowned as key DBMS

Called strategic, although DEC vows continued support of older systems

ANALYSIS

BY AMY CORTESE
CW STAFF

BOSTON — Following up on its earlier "Computing for the '90s" announcement, Digital Equipment Corp. recently sought to clarify its database strategy, casting RDB as its strategic database management system for VMS while juggling its older DBMSs and an upcoming Ultrix DBMS.

DEC's attempt to position RDB as its strategic DBMS for new development of production applications while maintaining support for its older, widely installed data management systems is reminiscent of IBM's dual-database predicament.

Likewise, many are predicting RDB will become the equivalent of DB2 — that is, it will dominate the VMS market as DB2 has dominated the mainframe world and force independent software vendors to shift their emphasis to tools.

"Much as DB2 was underestimated by virtually every third-party vendor in 1985, RDB is being similarly dismissed today," explained Bob Therrien, an analyst at Paine Webber, Inc. in New York. However, Therrien said he sees RDB emerging as the standard in the VAX environment for large-scale production applications.

Dominant power

John Logan, an analyst at Cambridge, Mass.-based Aberdeen Group, Inc., agreed, saying that RDB will become the dominant DBMS for commercial processing in VMS environments.

The reason, analysts said, is that DEC will have an advantage in closely tying its DBMS engine to the VMS operating system and improvements made to it.

Also at work, according to the analysts, is a logical trend toward bundling more data management functionality into the operating environment, just as IBM has done with the OS/400 and OS/2 Extended Edition. DEC made a move in that direction with the bundling of a run-time version of RDB with VMS earlier this year.

According to Computer Intelligence (CI), a market research firm based in La Jolla, Calif., 68% of VAX sites — more than 20,000 — currently have no full DBMS.

Those users are the reason the VAX market is so hotly contested by Oracle Corp., Relational Technology, Inc. and other vendors. If DEC has its way, those vendors will be relegated to competing among each other for the tools market. But the battle is still far from over.

A survey of planned DBMS purchases showed that Oracle and RTI came out clearly ahead of DEC. Dave Eulitt, an analyst at CI, said the major reason behind these findings is a growing preference among users for open systems and multivendor environments.

Portability counts

Jack Wilkerson, a product engineer at Deere Technical Services, a division of Deere & Co., said that portability was more important in choosing a DBMS than the benefits derived from a closely integrated DBMS and operating environment.

"As technology advances, the likelihood of staying with one vendor gets less and less," Wilkerson said. Deere Technical Services uses Oracle to drive its VAX-based engineering systems.

However, at John Deere Engine Works, another Deere & Co. division located in Waterloo, Iowa, RDB is the DBMS of choice.

"When it came down to portability vs. performance, we picked performance," said Carlo Pensyl, manager of computer systems. He maintained that networking has undercut the issue of portability. Deere Engine Works, which switched from Or-

Continued on page 28

Slash of the Titan eases debut of high-end minis

BY JAMES DALY
CW STAFF

SUNNYVALE, Calif. — In a move designed to soften the landing of a new product line scheduled for introduction this fall, Ardent Computer Corp. recently cut the prices on its Titan family of graphics supercomputers by up to 30%. The price-slashing on both the desktop and server versions of the Titan is designed to clear the way for a line of high-end minisupercomputers and low-end personal graphics supercomputers, Vice-President Greg Hopwood said.

The Titan's original price of $79,000 was cut to $55,300, while the server version of the machines was lowered 21% from $52,500 to $41,300, Ardent officials said. Multiprocessor version of both models will be similarly discounted.

Although Hopwood said an important impetus for the move was the recent lowering of dynamic random-access memory chips costs, analysts noted that ripples from the ongoing price/performance wars among workstation vendors such as Digital Equipment Corp. and Sun Microsystems, Inc. have increasingly put pressure on such graphics supercomputer vendors as Ardent and Stellar Computer, Inc. to make similar price cuts.

Inside

- Dell grows into Tandem world. Page 25.
- Brownstone's Data Dictionary makes the life cycles easy. Page 25.
- Silicon Graphics cuts prices, adds to line. Page 30.

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23. Dir., Mgr., Suprv., Analyst, of Systems
31. Dir., Mgr., Suprv., of Programming
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35. Dir., Mgr., Suprv., OA/WP
38. Data Comm. Network/Systems Mgt

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80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
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No grass growing under Dell's feet

ON SITE

BY J. A. SAVAGE
CW STAFF

AUSTIN, Texas — Dell Computer Corp., the Sears Roebuck of mail-order computer companies, is rapidly adding CPUs and office space to keep up with its exponential growth.

In 1987, instead of accepting the "normal" corporate growth path and graduating from an IBM System/36 to 370 mainframe architecture, Dell dropped the IBM environment completely and bought into Tandem Computers, Inc.'s proprietary Guardian operating system.

"It wasn't so much the fault tolerance [of Tandem computers] — IBM will tell you it has fault tolerance — but our decision was weighted toward modularity," said Stephen Spilker, vice-president of information services.

Spilker said that the company had "no more difficulties developing applications for the Tandem VLX computers than any other mainframe." Currently, sales and support is operated off of an eight-processor VLX, but in the next month, two processors will be pulled from that configuration and dedicated to the manufacturing floor.

Dell's Spilker

The phone-order system, which accounts for most of Dell's business, is inventory-intensive. "We take the order, and the customer configures it over the phone. Then, that customer's name is on the [ordered] computer," Young said.

"Each computer has a tag on the back," Spilker agreed, "so that any time a customer calls, we can put off the history of the computer on the [salesperson's] screen."

The compute-intensive sales operation is handled out of the original office building, a building that houses about 800 salespersons along with the computer room. Part of the information systems' obstacles with Dell's rapid growth is the lack of real estate adjacent to its office tower full of salespeople. Dell ran out of room at approximately the beginning of the year and moved its administrative offices and manufacturing to a site 2.4 miles away.

Yet the major problem with rapid growth — 128% from 1987 to 1988 — is not adding Tandem CPUs but adding hundreds of users each month, according to Dennis Young, manager of Dell's networked systems. The additions do not come out to five users per day but rather entire departments at one time as the company expands into new offices. "We usually take the opportunity to put them on a local-area network," Young said. While acknowledging that Tandem's network software has improved during the last couple of years with the acquisition of Ungermann-Bass, Inc., Dell is in no hurry to switch networking products, according to Young.

Of the 1,200 employees, 800 are on a LAN, he said. There were only 220 people in the company 2½ years ago, he added.

Least of the worries

Adding personnel and their computer requirements is one of the least of Spilker's worries. Each terminal is a Dell computer. "There's a lot of horsepower wasted on the desktop," he said. Still, Spilker said that "integrating Tandem and Dell allows us to do a lot with not a huge budget."

The new building complex is being wired with fiber-optic cables, but Dell declined to rely on cables for the link between its high-rise sales office at the old site and its new campus. The old site is also where the computer center lies.

"It doesn't make sense to move the computer room," Spilker said. So Dell is installing a 10M-bit microwave dish to replace its temporary lease lines and T1 lines through Southwest Bell. The project should be complete by the middle of next week. "The microwave will save money and probably improve response time," he said.

Brownstone lassos data solution

BY ROBERT MORAN
CW STAFF

Early users of Brownstone Solutions, Inc.'s latest version of its Data Dictionary/Solution (DD/S) for IBM's DB2 said that it has eased the burden of keeping track of data moving through life cycles and eased their trepidation in keeping track of IBM's rumored repository.

The company, based in New York, last June introduced Version 3.0, which contains numerous enhancements geared toward adding entity and relationship types and reorganizing older types while keeping track of the data as it moves from development to testing to production.

"We provide a set of completely tailorable and extensible rules," said Brownstone President Lewis Stone. "Users can add new life cycles, new rules about what relates to what and about how objects migrate from one life cycle to another."

For example, with one enhancement, called versioning, DD/S users can define a database object more than once and in different ways. DD/S will track the evolution of that object. Previously, Brownstone users could add variations and division numbers to entity types but could not define whether that object was in development, testing or production stages, Stone said.

The new version costs $55,000 and is available at no charge to users of the previous release, the company said. DD/S is about two years old.

Version 3.0 user Dan Croak, a systems analyst at Reader's Digest Association, Inc. in Pleasantville, N.Y., said that the new version of DD/S eliminates mistakes during migration because it offers many more controls than the previous version. "In the old version, the controls were limited and migrations weren't always done by the same developer," he said. The new version, which automates the process, should help the company avoid mistakes, he said.

According to Linda Hurst, an associate at Hewitt Associates in Lincolnshire, Ill., the company will use Version 3.0 of the dictionary to control not only the migration of data development, testing and production but also for project management on personal computers.

> "IN THE OLD VERSION, the controls were limited and migrations weren't always done by the same developer."
>
> DAN CROAK
> READER'S DIGEST

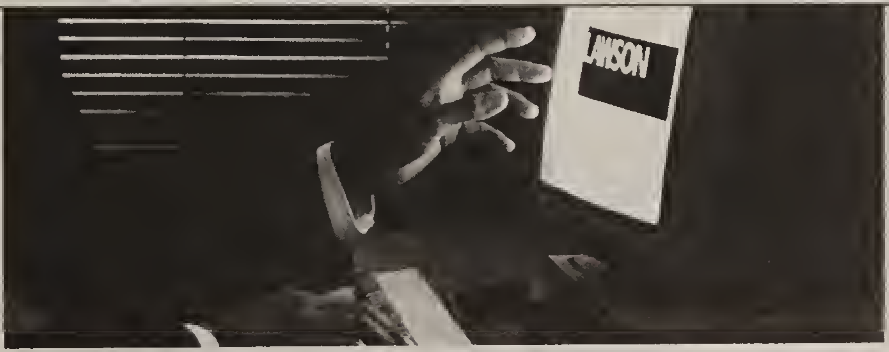
"We're just starting to use PCs for development on mainframes and on PCs," Hurst said. "We thought about having life cycles that indicate to us that the work is being done on the PC and not on the mainframe."

The merits of the enhancements notwithstanding, Colin White, an independent consultant in Morgan Hill, Calif., and editor of *InfoDB*, a database journal, said that many of the existing dictionaries are helpful for the back-end development tools and the database management systems, but front-end computer-aided software engineering (CASE) vendors present a problem.

"The CASE vendors all have their own modeling techniques and tools and therefore their own meta definitions," he said. "It is a question of to what extent a vendor can build a dictionary that can accept all those meta definitions."

Indeed, IBM is in the midst of

Continued on page 28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HARD BITS

Storage Tek matches IBM move

Storage Technology Corp. was quick on IBM's heels late last month when it announced improvements to its IBM 3480-class tape subsystem. The company said the enhancements are 100% compatible with IBM's 3480 Improved Data Recording Capability (IDRC). The Storage Tek enhancements mirror IBM's by providing up to five times more tape capacity than the current Storage Tek 4480 as well as performance improvements of up to 70%. Storage Tek said it will price its enhancement within IBM's price range and has scheduled shipment for the second half of 1990. IBM's pricing starts at $15,000.

Multiflow Computer, Inc. said it signed a distribution agreement with C. Itoh Techno-Science Co. in Tokyo that could be worth up to $30 million for Multiflow in the next three years. C. Itoh will resell the Multiflow Trace line of minisupercomputers in Japan and provide service and support for those systems.

The IBM Application System/400 third-party tape-drive market is getting crowded. Late last month, **General Business Technology, Inc.** in Irvine, Calif., tossed its hat into the ring with the announcement of the GTE 4504 Turbo-Pate. The ½-inch cartridge drive, which was designed to work with AS/400 Models B30 through B70, is based on the drive built by Cipher Data Products, Inc. With a starting price of $24,000, the drive reportedly offers a data transfer rate of 896K bit/sec.

Motorola, Inc.'s Microprocessor Products Group said its 88000 chip, with a clock speed of 33 MHz, is available in "general sampling" quantities. The 88000, Motorola's reduced instruction set computing chip, is currently in volume productions at 20 and 25 MHz. The newest version will run at a rate of 28 million instructions per second.

Quarter-Inch Cartridge Drive Standards, Inc. announced that member companies adopted a standard for 1.35G-byte tape drives that use ¼-inch tapes. The group said it expects member companies to have products based on this standard available for shipment by mid-1990. The standard covers the recording format, interfaces and the magnetic head used with the tape. The group is an industry association set up to promote the use of ¼-inch tape drives.

Convex Computer Corp. said it will offer an Ada compiler that it describes as automatically parallelizing for its minisupercomputers. The compiler can use the Convex parallel processing environment without programmer intervention, the company said. It includes a task-spreading capability that allows Ada tasks to run on multiple CPUs on the Convex platform.

SOFT NOTES

MSA touts pair of IMS tools

Management Science America, Inc. in Atlanta demonstrated its support for IBM's non-Systems Application Architecture database recently with the introduction of new IMS versions of its accounts payable and purchasing applications. AP/PH 89.1 for IMS-DB/DC and IMS-DC/CICS are available separately or as integrated products and were designed to automate an organization's entire procurement cycle, according to MSA.

AT&T said it shipped its second pre-release version of Unix System V, Release 4.0 to members of Unix International last month. The firm also said it no longer requires runtime licenses for the Open Look graphical interface, included in the Release 4.0 source-code tapes. Release 4.0, which will merge features of Unix System V, Microsoft Corp.'s Xenix, Sun Microsystems, Inc.'s SunOS and Unix 4.2 from University of California at Berkeley, will be available this fall.

Neal Nelson & Associates in Chicago has once again invited database management system vendors to participate in the Database Performance Review conducted at the Unix Expo trade show in New York Nov. 1-3. The DBMS vendors are invited to benchmark their products in a side-by-side comparison, to be audited by an advisory council made up of representatives from seven large DBMS users.

Cimlinc, Inc. in Itasca, Ill., citing a new approach to marketing computer-aided design software, announced it has dramatically reduced prices for its Unix-based mechanical computer-aided design and manufacturing software by one-half to two-thirds the price. The firm said it had restructured its operations to accommodate its new pricing strategy, called Everyday Low Pricing.

The Continuum Co. in Austin, Texas, and **Multi Soft, Inc.** in Lawrenceville, N.J., recently announced a licensing and distribution agreement. Under terms of the agreement, Continuum may use Multi Soft's Super-Link cooperative processing software to create front ends for its current insurance applications and any future applications. Multi Soft entered into a similar agreement last year with Atlanta-based Management Science America.

RDB

CONTINUED FROM PAGE 23

acle two years ago, uses RDB for transaction-oriented shop floor systems that exchange information with an IBM mainframe running IMS. The division moved from Oracle to RDB two years ago because RDB was less expensive and better integrated with DEC's development tools and dictionary.

Similarly, John Vottero, a corporate computer systems manager at Crane Plastics in Columbus, Ohio, said, "As a VAX shop, there's really no reason to go with anything other than RDB."

However, Vottero lamented the lack of applications available for RDB. Most of the firm's software for RDB — transaction-oriented systems for inventory, invoicing and shipping — was written in-house, mostly out of necessity.

Recognizing that RDB's success depends on the availability of an attractive selection of software applications, DEC has inaugurated an independent software vendor program designed to help third parties build applications based on RDB and CDD Plus.

More than 50 software vendors have signed up for the program, dubbed the RDB Solutions Vendor Program, or RSVP.

Brownstone

CONTINUED FROM PAGE 25

such a struggle, he said, and any vendor that comes out with a full life cycle dictionary must struggle with the same problems.

According to David DeCamp, a product developer at Brownstone, "The open architecture of DD/S permits a variety of interfaces between Brownstone and third-party tools, but right now, we don't offer real-time, cooperative processing feeds."

Croak said that Reader's Digest is in the process of developing in Information Engineering Workbench, a CASE tool from Knowledgeware, Inc. in Atlanta.

Neither Hurst nor Croak are worried about IBM's repository. Some action on IBM's repository "may be right around the corner, but I'm not sure that it will be what we want to use it for," Hurst said. "Even if we want to use IBM's, the experience that we have gained with repository technology and the concept of doing things from a central place will be helpful if we cut over to IBM."

Croak said he believes that IBM's repository "would come out in piecemeal" and that Reader's Digest would be able to migrate to IBM but would do so "only if IBM provides a good reason to move."

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Hamilton

FROM PAGE 23

manage it. But when this event is put together with others, one can see why users are getting spooked.

One of IBM's problems right now is that users have good memories; they remember when the first 3380 disk drives were announced almost a decade ago. That rollout was bogged down by big reliability problems and resulted in yearlong delays. As one user described it, "They have had a bad history with DASD."

This factor alone could worry users. But there's more.

Take, for instance, the timing. IBM canceled the 3390 announcement just a few months after technical problems cropped up with the 3090 S models — its latest mainframe generation. The mainframe and disk-drive development efforts are not directly related, but the problems are connected from users' points of view. After all, they are two important products for a large data center.

When we hear a vague explanation about an S model chip problem early in the year and then we hear another vague explanation about a disk-drive problem a few months later, one can wonder what exactly IBM is doing with the high end of its business. Is it trying to get products out too fast? Can it meet the technical challenges that these new generations present? If a user makes a commitment to either of these products in the near future, will he do so at the risk of having a problem with a critical component of his data center?

Add to this the timing of the cancellation of the disk-drive announcement itself. According to users and analysts, IBM had alerted key people to the scheduled introduction, and then it bailed out just a few days before announcement day. Users interviewed in the aftermath questioned why IBM was so close to announcing the product before it realized the problem, whatever it was, was too great to go on. What's more, it came as a surprise to some users who had been planning to use the new drive in upcoming projects. Nobody likes that kind of surprise.

IBM's next step is very important. It will supposedly have a good idea of what went wrong with the drive in two to three weeks. At that point, it should level with its users, or it may end up with a much bigger problem on its hands.

Hamilton is *Computerworld's* senior editor, systems.

Silicon pares price of Unix workstation

BY J. A. SAVAGE
CW STAFF

MOUNTAIN VIEW, Calif. — Silicon Graphics, Inc. recently cut prices by 31% on its Unix low-end three-dimensional graphics workstations, increased low-end performance and added midrange and high-end models, as well as a server.

Its low-end, 10 million instructions per second (MIPS) diskless Personal Iris machine, which had been $18,000, is now priced at $13,500. Similar cuts were made for a disk model and a 16-MIPS machine. Iris models will also be available with 20-MHz reduced instruction set computing processors from Mips Computer Systems, Inc. this month, according to the company. The rest of the lines also use Mips' processors.

On the more expensive side, two additions were made to its Iris Power series. The 4D/280 eight-processor system operating at 160 MIPS for $172,500 and the 4D/210 system with one processor and 20 MIPS will both be available next month for $94,900. Also introduced was a 16-MIPS server, called the Power Center, for $12,900.

Also, for $4,000, the company will sell lightweight sunglasses with a stereo LCD emitter to give the illusion of real 3-D. Such a system previously sold for $12,000, the company said.

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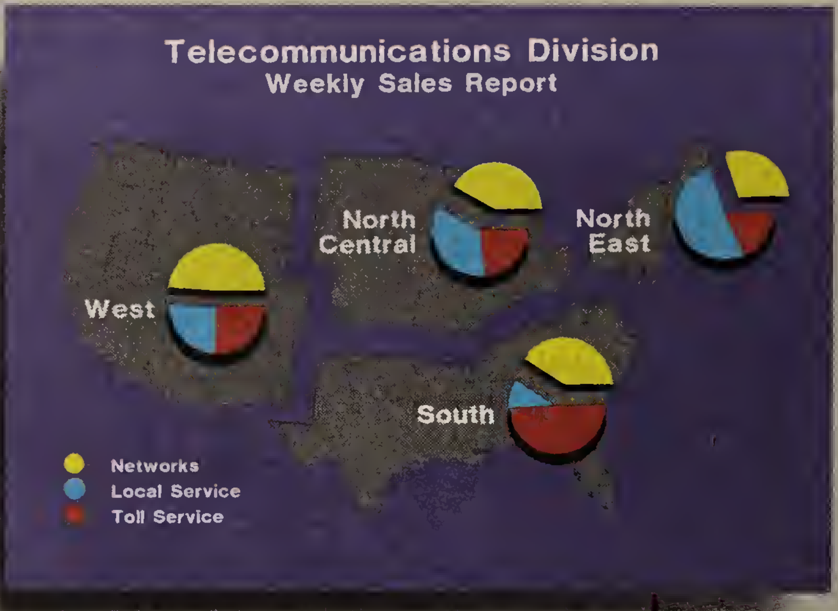

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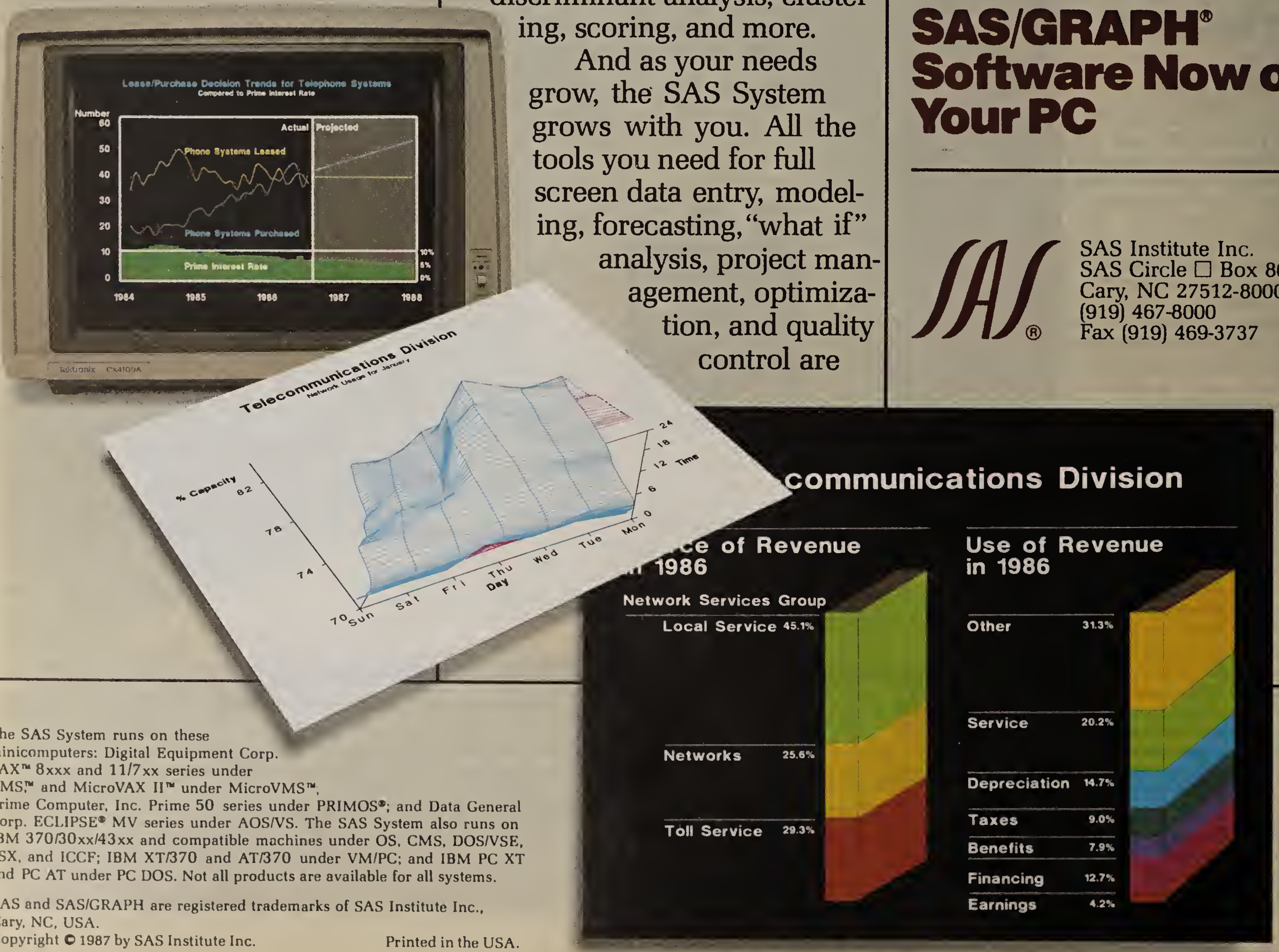

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NEW PRODUCTS

System software

Lasodyne Corp. has announced a supermicrocomputer software platform that reportedly integrates image and text processing while interfacing to database and communications applications in environments such as DOS, AT&T's Unix System V and OS/2.

According to Lasodyne, the Image Data Authoring System is a variable configuration of hardware and software. Written in C language, it runs on Intel Corp. 80386-based machines and supports a range of scanner performances, the company said. The central processor configuration is said to include 640K bytes of random-access memory, a 1.2M-byte floppy disk drive and a 91M-byte small computer systems interface hard disk with controller.

A single, self-contained unit sells for less than $50,000; a two-user networking version sells for less than $90,000.

Lasodyne
Suite 112
2522 Chambers Road
Tustin, Calif. 92680
714-544-2751

Venturcom, Inc. has released a real-time Unix System V.3.2 operating system for standard Intel Corp. 80386 personal computer platforms.

Called Venix Version 3.2, the operating system reportedly incorporates 386/IX from Interactive Systems Corp. with Venturcom's RTX Version 3, a set of real-time extensions and device driver capabilities. The system is also said to offer Xenix compatibility, X Window System, DOS under Unix and Network File System and Remote File Sharing for distributed applications.

The price tag is set at $749.

Venturcom
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Cambridge, Mass. 02142
617-661-1230

Applications packages

Gould, Inc.'s Imaging and Graphics Division has announced an advanced version of its high-end image processing software package for use with its IP9000 and IP8000 image processing hardware systems.

According to Gould, LIPS Version 7 provides a streamlined series of commands to assist users in accessing, analyzing and manipulating images. It runs on the IP9000 platform with Unix-based Sun Microsystems, Inc. Sun-3 and Sun-4 workstations and can also be used on the IP8000 and IP9000 systems with Digital Equipment Corp. VAX/VMS-based systems. LIPS costs $8,800 for new users.

Gould
46360 Fremont Blvd.
Fremont, Calif. 94538
415-498-3200

Shaw Systems Associates, Inc. has announced Update 12 of its Consumer Loan and Line of Credit System.

Enhancements to the IL/80 system reportedly include automated on-line placement and cancellation of insurance with what-if capability. It was designed for IBM mainframes running MVS or VSE and is supported on-line under CICS or IMS.

The IL/80 is delivered under a license agreement at a cost of $150,000, with an $18,750 annual maintenance fee after the first year.

Shaw Systems
13811 Village Mill Drive
Midlothian, Va. 23113
804-794-3316

Utilities

Carolian Systems International, Inc. has announced Sysview/XL, an on-line performance measurement tool for Hewlett-Packard Co.'s Precision Architecture 3000 computer environment. The product reportedly provides global and process level data for performance measurement analysis. Sysview/XL costs $9,000.

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C&C Computers and Communications

NEW PRODUCTS — SYSTEMS

Processors

Matrix Corp. has introduced the MD-CPU320, a CPU board for real-time system users.

The board reportedly offers a 16- to 33-MHz 68020 processor, up to 8M bytes of dynamic random-access memory, a 30M byte/sec. transfer rate on Motorola's VMEbus and the public domain expansion bus — the Dbus. According to Matrix, the board supports multiprocessing with mailbox interrupts and software-programmable memory addressing. The product also reportedly features battery-backed static random-access memory and a time-of-day clock.

Pricing starts at $2,395.

Matrix
1203 New Hope Road
Raleigh, N.C. 27610
919-833-2000

An attached processor for users of Digital Equipment Corp.'s Microvax II and Series 3000 computers is available from Mercury Computer Systems, Inc.

According to the vendor, the MC3200-25QB is a single board that occupies one slot and has a 25 million floating-point operations per second and a 12 million-instructions-per-second engine with up to 8M bytes of memory. Additional features are said to include a library of microcoded algorithm routines, vector and scalar functions and additional software tools, such as a code profiler and debugging utilities.

Pricing begins at $12,200 for a 2M-byte system.

Mercury Computer Systems
Wannalancit Technology Center
600 Suffolk St.
Lowell, Mass. 01854
508-458-3100

Data storage

Silicon Graphics, Inc. has unveiled a disk drive and a tape drive for its Iris Professional and Power series products.

The 780M bytes enhanced small device interface disk drive reportedly allows approximately 3G bytes of 5¼-in. disk storage per workstation, operates at 20 MHz and is driven by a four-port intelligent controller that features command queuing, command sorting and seek optimization.

The 2G-byte helical recording tape drive uses 8mm media and reportedly achieves transfer rates of 240K byte/sec.

The disk drive sells for $9,000; the tape drive costs $8,950.

Silicon Graphics
P.O. Box 7311
2011 N. Shoreline Blvd.
Mountain View, Calif.
94039-7311
415-960-1980

Trimarchi, Inc. has announced the Datakeg Twin Sixes optical disk drives for Digital Equipment Corp., Sun Microsystems, Inc., IBM Personal Computers and Apple Computer, Inc. Macintosh machines. The dual drives offer Winchester technology and provide over 600M bytes of random-access, removable, erasable optical backup, the vendor said. They are packaged in a tabletop unit and provide a peak transfer rate of up to 1.5M byte/sec. Prices range from $7,995 to $21,500, depending on hardware platform.

Trimarchi
P.O. Box 560
State College, Pa. 16804
800-356-6638

I/O devices

Peritek Corp. has introduced the VCW-Q, a color display controller for the Digital Equipment Corp. Q-bus.

The single dual-height board supports medium resolution requirements of 640 by 512 pixels and offers one or two independent channels, according to the vendor. The product is reportedly available in several configurations, including four- and eight-bit graphics, with or without color alphanumeric overlay, and with a choice of one or two graphics cursors. Pricing starts at $1,700.

Peritek
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Oakland, Calif. 94619
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PCs & WORKSTATIONS

MICRO BITS

Michael Alexander

Not so fast, please

In the past week or so, I have been blitzed by faxes and telephone calls from individuals and organizations clamoring for the head of Robert T. Morris Jr. As nearly everyone who is remotely interested in computers must know by now, Morris is the 24-year-old former graduate student who has been accused of creating and unleashing a worm over the Internet computer network last November.

Ostensibly, Morris set out to demonstrate that security on Internet was overly lax. His alleged worm evidently was supposed to replicate itself a single time on each computer system that it targeted, but a programming gaffe caused the worm to reproduce uncontrollably until it filled the memories of some 6,000 computers, causing them to shut down.

Finally, nine months later, the U.S. Justice Department is satisfied that it has enough evidence to prosecute — and presumably convict — Morris under an untested provision of the Computer Fraud and Abuse Act of 1986.

A few weeks ago, a federal

Continued on page 40

OS/2 move still guessing game

BY CHARLES VON SIMSON
CW STAFF

The promised applications are flashy and the potential power compelling, but information systems managers who have marshaled their companies through the early stages of the migration to OS/2 report that the transition remains a daunting leap of faith.

Spurred by a need for true multitasking, Kentucky Fried Chicken Corp. (KFC) began to implement OS/2 Version 1.1 with LU6.2 functionality in 1,200 corporate-owned stores last September. The code was made available early by Microsoft Corp. without Presentation Manager. Most of the reporting and point-of-sale applications involved were ported from DOS.

"It has functioned extremely well," said Monte Jones, IS director at KFC, "but it has been extremely difficult to be ahead of the technology. I wish we could have done it next year."

Managers who have begun to position their companies tell of a long, slow fight for the hearts and minds of users who control budgets and are unwilling to pay the high price for an operating system that still lacks applications, particularly under Presentation Manager. They are concerned about managing the coexistence with DOS and about undelivered promised functionality in OS/2.

So. California Gas' Holmes

Users are not alone in their impatience for applications, however. "OS/2 Presentation Manager applications will be the driving force behind an uptick in OS/2 sales," said Microsoft OS/2 product manager Mark Mackman. "They will be there, and it is important to begin now to position corporate environments." At the moment, few besides Mackman are convinced that the time is ripe to move to OS/2, and large-scale projects remain rare. A recent survey by Computer Intelligence showed that 86% of U.S. corporations are neither using nor plan to use OS/2.

At the same time, leading technology users have at least pilot applications in place. The demands of ever-larger networks and tightening competitive environments leave IS managers looking for available weapons.

While the OS/2 migrants' belief in the potential of the technology is strong, their experiences to date make for a cautionary tale.

"You have to sort out reality from the marketing message," said Robert Holmes, a technology research analyst at Southern California Gas Co. "[The tools] will be here, but they are certainly not here yet."

Holmes said his company's pilot projects have faced more than typical problems at the start of a technology curve.

Beyond a lack of applications, Holmes said he is concerned about holes in the functionality of the operating system and support tools. "The lack of development tools for Presentation Manager leaves us little to get by with," he said.

Coexistence with DOS will further continue to complicate the transition well into the 1990s. Cigna Corp. will triple the number of personal computers within the company in the next three years and has standardized on OS/2. "If new investments have to be made, they

Continued on page 43

Rorer doubles up with Compaq/Novell tandem

ON SITE

BY MICHAEL ALEXANDER
CW STAFF

FORT WASHINGTON, Pa. — When Rorer Pharmaceuticals doubled in size as a result of a merger about two years ago, the human resources department had to scramble to find a way to incorporate the influx of new employees into a companywide computer system.

The existing human resources system, based on a mainframe, simply was not adequate for the variety of employee programs that were planned, said Marc Kustoff, Rorer's senior manager of microcomputing.

"I was hired as a manager of human resources information systems with a mandate to develop a companywide human resources system and build it as quickly as possible," Kustoff recalled.

His solution was to install a system of 45 Compaq Computer Corp. Deskpro 386 personal computers on a Novell local-area network. The company's "application of choice" was HR-1 from Revelation Technologies, Inc., considered by Rorer to be among the best available for human resources management, Kustoff said.

"HR-1 happened to run on MS-DOS machines, so the real issue was, could we configure a network with enough horsepower to run a heavy-duty database of this type?" he said.

Such human resources programs are used to store a wide variety of personnel information, project the impact of a salary in-

Continued on page 41

Inside

- Nintendo zaps competition with handhelds. Page 39.
- Opposing sides battle with PCs over Supreme Court abortion decision. Page 39.
- NEC products boost graphics resolution, speed. Page 40.

Some folks think that COBOL, the language of the past, may also be the language of the future!

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Micro Focus COBOL/2 Workbench Awarded 1989 Professional Solutions Award . . . . PC Tech Journal, 2/89

"The COBOL/2 Workbench, available from Palo Alto based Micro Focus, Inc. is by far the most powerful and complete PC-based COBOL development and maintenance toolset. This package is the Cadillac of PC COBOL toolsets." . . . . System Builder Magazine, 1/89

Micro Focus "ANIMATOR is a sparkling example of the reason why the PC-based COBOL workstation represents a quantum leap in programmer productivity." . . . . Database Programming & Design, 10/88

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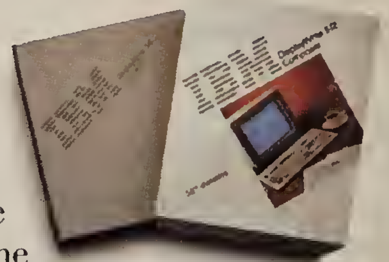

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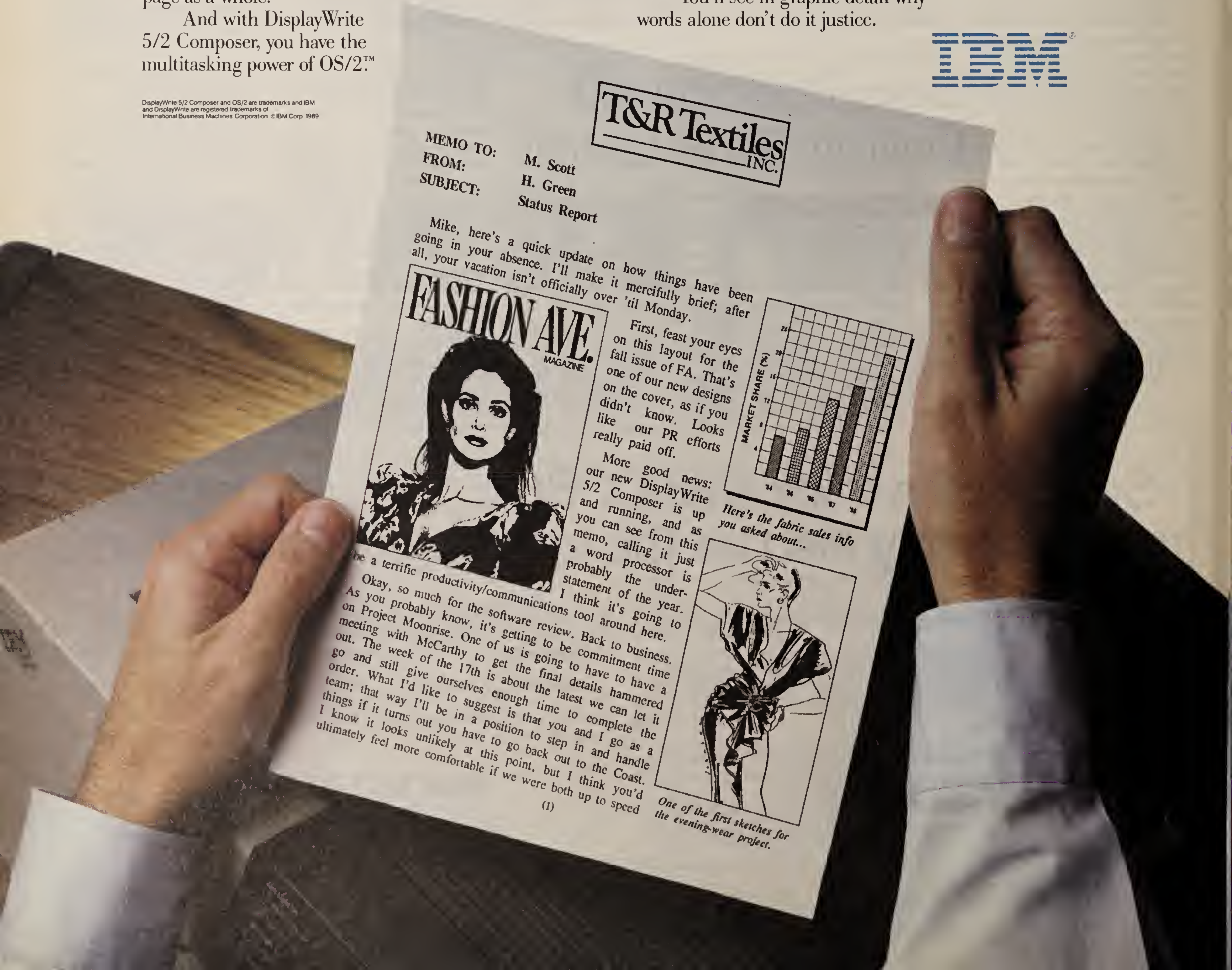

T&R Textiles INC.

MEMO TO: M. Scott
FROM: H. Green
SUBJECT: Status Report

Mike, here's a quick update on how things have been going in your absence. I'll make it mercifully brief; after all, your vacation isn't officially over 'til Monday.

First, feast your eyes on this layout for the fall issue of FA. That's one of our new designs on the cover, as if you didn't know. Looks like our PR efforts really paid off.

More good news: our new DisplayWrite 5/2 Composer is up and running, and as you can see from this memo, calling it just a word processor is probably the understatement of the year. I think it's going to be a terrific productivity/communications tool around here.

Okay, so much for the software review. Back to business. As you probably know, it's getting to be commitment time on Project Moonrise. One of us is going to have to have a meeting with McCarthy to get the final details hammered out. The week of the 17th is about the latest we can let it go and still give ourselves enough time to complete the order. What I'd like to suggest is that you and I go as a team; that way I'll be in a position to step in and handle things if it turns out you have to go back out to the Coast. I know it looks unlikely at this point, but I think you'd ultimately feel more comfortable if we were both up to speed

(1)

Here's the fabric sales info you asked about...

One of the first sketches for the evening-wear project.

Handheld PCs aid Nintendo sales reps

ON SITE

BY RICHARD PASTORE
CW STAFF

REDMOND, Wash. — Try this for a video game: You control a field force of 130 merchandising representatives, each armed with a handheld computer. Your goal is to race them around to various retail outlets, find and record 14 pieces of merchandising data and relay it as quickly as possible over a network to your headquarters host.

This scenario probably would not make for a best-selling cartridge, but for Nintendo of America, which implemented just such a handheld system for its merchandising force, it is a winning strategy.

Nintendo's 130 merchandisers use handheld data collection computers from Panasonic Communications & Systems Co. to monitor the company's products in retail stores. Their 14 checkpoints include sales floor and warehouse inventories, prices and shelf space. They also use the machines to conduct on-site consumer surveys and keep track of their work hours and expenses. The machines have helped Nintendo shave the time required for processing sales information from as long as two months to one day.

Overnight processing

The handheld units transmit the collected data by modem to the company's IBM System/38 host here over a McDonnell Douglas Computer Systems Co. Tymnet network. The host processes the data overnight and prepares a summary for use by upper management the following morning.

Each merchandiser must track stock listed in a catalog of 160 video game titles for 15 to 110 stores. Understandably, keeping tabs on each retail outlet's inventory under the former manual method did not score well.

"Under the old system, the merchandisers had multipart forms that they would fill out all this information on," said Mark Thorien, Nintendo's project manager for the handheld system. The forms were mailed to headquarters, where data was keyed into the mainframe.

It took 30 to 60 days from the time the merchandiser visited the store to the time the data was compiled in a report at headquarters. "By that time, the information was so untimely that it was basically worthless," Thorien said.

Timely information is crucial in the toy industry; consumers are fickle and always on the lookout for the next hit title. "There are real dramatic swings between what people want one day and what they want the next. You have to stay on top of it, or you get stuck with a lot of inventory that you can't sell," Thorien explained. The new system provides for 24-hour information turnaround. "It gives us an immediate indication of what particular products are selling well vs. others," he said.

FRANK C. O'CONNELL

The automated system has also improved accuracy. Without the endemic errors of data-entry people misreading merchandisers' handwritten figures, the data accuracy rate has approached 99%, Thorien said.

By eliminating the merchandisers' paperwork burden, Thorien added, the system also "frees them up to spend more time in a personal relationship with retailers and customers."

Thorien chose Panasonic's Data Partner from among 40 competitors at the beginning of last year because it was one of the few that offered the ability to program in C, a language that many Nintendo programmers were already using. Consequently, the company was able to get the system up and running in less than 90 days. The training time totaled about 12 hours per user.

Vital stats

The units are configured with 256K bytes of random-access memory and are expandable to 1.5M bytes. They weigh 18 ounces and sport an eight-line backlit display.

The computer runs the MS-DOS operating system, which enabled Nintendo programmers to write a communications program in C.

The program runs on both the host and the handheld unit, permitting two-way communication.

The host, for instance, can transmit "memos, changes in product information or instructions to call on a particular store the next day," Thorien said.

Abortion foes compatible over PCs

BY ELLIS BOOKER
CW STAFF

Within 10 hours of the U.S. Supreme Court's landmark decision last month giving state legislatures greater discretion in regulating abortion, the direct mail firm used by pro-choice advocates sent the approved text of a letter to several printers and mail houses around the country.

Using membership lists compiled from the National Abortion Rights Action League (NARAL), Planned Parenthood, the National Organization for Women and the American Civil Liberties Union, the letters were produced on a laser printer and mailed to some 900,000 U.S. households. It was an impressive, if not uncommon, use of computer databases to promote a political cause.

While direct mail companies on both sides of the abortion issue are compiling massive electronic lists for what all agree will be an intense season of state legislative activity, the computer resources at the pro-choice and pro-life organizations are much more modest and comparable to each other.

"We're comfortable with what we have in this office," said Ernest Ohlhoff, director of outreach programs at the Washington, D.C.-based National Right to Life Committee, Inc. Ohlhoff explained that his organization uses stand-alone IBM Personal Computer XT- and AT-compatible microcomputers for word processing and some database applications. State groups that are just forming, he said, are encouraged to use MS-DOS-based machines.

MS-DOS compatibility is also recommended by NARAL, likewise based in Washington.

"We've informally recommended compatible [systems]," noted NARAL personnel and operations manager Betty Mizek, who wears the hat of network administrator for NARAL's Novell, Inc. local-area network of 14 IBM PCs in the Washington office. "The affiliates are separate," Mizek continued, "but if we do hook them up, we want them to be compatible."

Indeed, the idea of connecting state groups with the national organization is mentioned by both NARAL and the Right to Life Committee. The value of such nationwide networks, which could help coordinate the efforts of the state and national groups in various state campaigns, is obvious. Significantly, neither side will discuss when or how its network — likely to be direct-dial modem-based connections — will be implemented.

At the national level, the two groups are also similar when it comes to software. Both have standardized on Wordperfect Corp.'s Wordperfect and use Ashton-Tate Corp.'s Dbase III, among other database programs, for maintaining targeted

Continued on page 43

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Alexander

CONTINUED FROM PAGE 37

grand jury in Syracuse, N.Y., indicted Morris on a felony count that carries a maximum sentence of five years in prison and a $250,000 fine. If found guilty, Morris could also be ordered to pay restitution to those whose computers or work was harmed by the worm.

Morris, if guilty, should be punished, but I'll hedge and not say that he should serve a specific time in jail or pay a certain amount in fines.

Certainly, his punishment should reflect the severity of his crime and at the same time signal to other would-be worm and virus crafters that there are stiff penalties for these sorts of destructive acts.

But before we can get to that point, we should not overlook the fact that Morris has yet to be tried.

Over the past nine months, I and other *Computerworld* staffers have reported numerous times that Morris is alleged to have created the worm. I believe that we have gone to considerable lengths to ensure that those reports are fair and, above all, accurate. Maybe we have not gone far enough.

A fair trial in doubt

The public hysteria that has followed in the wake of the Internet incident may make it difficult for Morris to get a fair trial. Already, Cornell University has suspended Morris following its own internal investigation into the Internet caper, without even waiting for an indictment.

It is also worth noting that the Computer Fraud and Abuse Act of 1986 does not specifically address crimes involving computer worms or viruses. Further, the law is quite ambiguous in many spots. Morris is alleged to have accessed a federal interest computer for the purpose of intentionally altering, destroying or damaging information. However, the act does not even define such terms as "access" and "information."

What may happen is that Morris will walk into a courtroom in Syracuse some months hence, and the case will be tossed out simply because he has in fact not committed a crime under existing laws.

If the case does go to trial, and no doubt it will, a jury of ordinary citizens is likely to have a difficult time understanding the nature of the crime that Morris is alleged to have committed. If sufficiently confused, the jury may give Morris the benefit of doubt and acquit him. While that may not make many people happy, it's the American way. So let's not be in a hurry to say that Morris should go to jail. Let's see that he gets a fair trial first.

If nothing else, the Internet affair has shown that there is a need for better laws covering computer-related crimes. I suppose we should be grateful for that, although it is unfortunate that this lesson came to us in the way that it did.

Assuming that he is found to be culpable, I hope that whatever punishment he receives is not so severe as to make it impossible for him to lead a constructive life. He is, despite his alleged programming slipup, evidently a talented programmer, and we certainly can use more of those.

Alexander is a *Computerworld* senior editor, PCs and workstations.

NEC focuses on resolution

BY MICHAEL ALEXANDER
CW STAFF

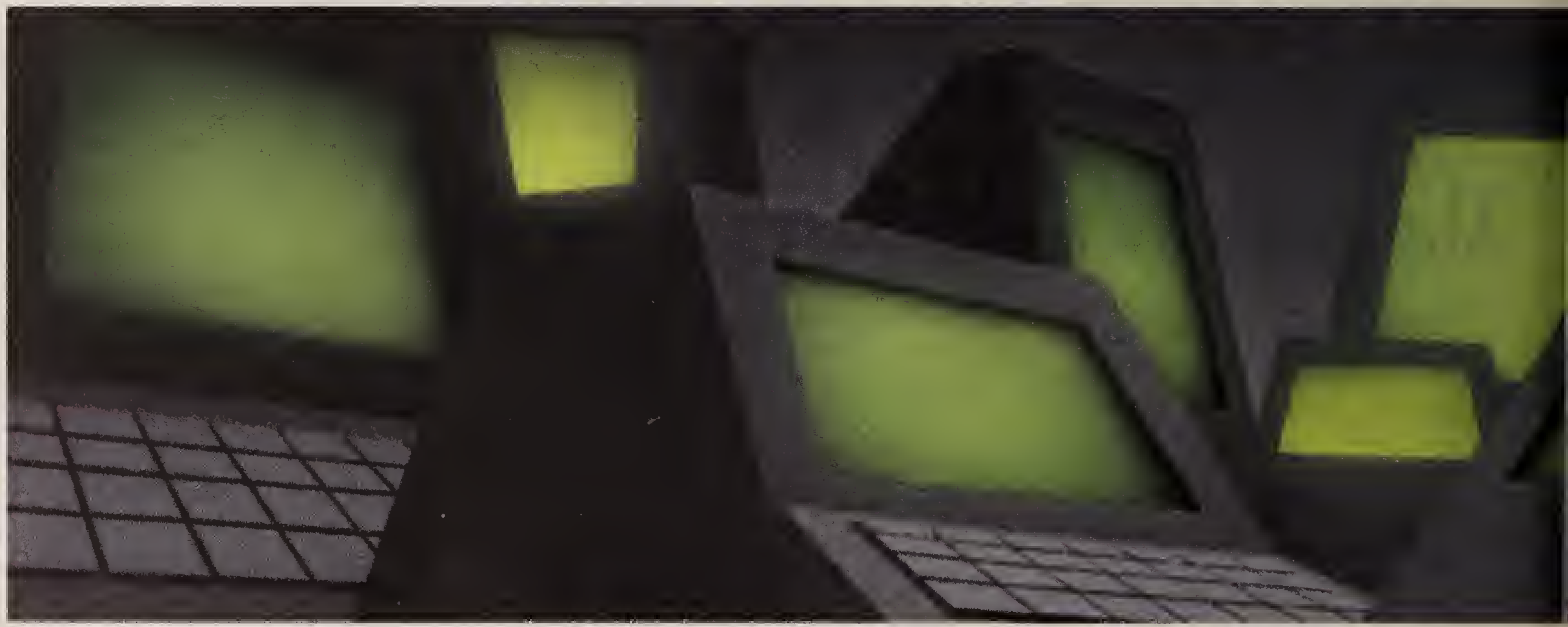
WOOD DALE, Ill. — NEC Home Electronics (U.S.A.), Inc. recently introduced four new products aimed at boosting graphics resolution and processing speed for end users. The company added three monitors — dubbed GS2A, 4D and 5D — to its popular Multisync monitor line as well as the Multisync Graphics Engine, a graphics adapter board compatible with IBM Personal Computers.

The graphics board, available in two versions, was designed to support power users who need speed, compatibility and multitasking support with Microsoft Corp.'s Windows, Presentation Manager, X Window System, computer-aided design and other graphics-intensive applications, the company said.

"Regardless of how fast the clock speed is in 386-based CPUs, users still face graphics performance bottlenecks," said Jerry Benson, vice-president of NEC's graphics business unit. "Using the Multisync Graphics Engine board, users will be able to draw graphics on their screens up to 400% faster at the 1,024-by-768 resolution than they now can at standard Video Graphics Array with the fastest VGA card on the market."

The graphics board is available now at a suggested retail price of $1,499 for the 16-color version and $1,999 for the 256-color version. NEC said that it will offer an IBM Micro Channel version in October.

The company also introduced the 4D and 5D color monitors and the GS2A gray-scale monitor, each of which is compatible with the new graphics adapter. The 4D, which has a $1,799 suggested retail price, has a 16-in. screen with a resolution of 1,024 by 768 pixels. The 5D, priced at $3,699, has a 20-in. screen and a 1,280- by 1,024-pixel resolution. The GS2A, at $349, has a 14-in. screen and 800- by 600-pixel resolution. The monitors are set to be available in September.



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After 25 years, Microsoft still benefits from Basic business

BY MICHAEL ALEXANDER
CW STAFF

REDMOND, Wash. — Bill Gates and Paul Allen built a company and personal fortunes with the personal computer version of the Basic programming language, which they developed in 1975.

Last week, Microsoft Corp., the company that Gates and Allen founded, celebrated the 25th anniversary of Basic and reaffirmed that it intended to enhance its Basic language products and maintain the language as a key element in its future business products.

In a keynote speech at a symposium of Basic developers in Seattle, Gates, now the chairman and chief executive officer at Microsoft, said that Basic's market potential remains strong and that its power and popularity ensures that it will be a pivotal part of the company's product strategy.

Basic remains the world's most popular programming language, according to market researchers.

Microsoft said that it has sold 500,000 copies of its Quickbasic worldwide during the past four years, with 200,000 units sold in 1989 alone. The company said that it expected sales to grow by 50% in 1990.

Research commissioned by the company indicated that about four million MS-DOS and PC-DOS operating systems users programmed in Basic last year, which is three times as many as any other language, the company said in a prepared statement.

Microsoft said that it has targeted the business programming market currently dominated by Ashton-Tate Corp.'s Dbase and Borland International's Turbo Pascal for Basic expansion.

Rorer

CONTINUED FROM PAGE 37

crease across a given job level and calculate elements of a flexible employee benefits program, as well as many other sorts of analyses. There are 1,200 data elements on each employee and 12,000 records, 5,000 of them on active employees, Kustoff said.

"I selected Compaq PCs primarily for performance," Kustoff said. "To get mainframe-level performance, we needed the absolutely fastest and best equipment available. Even so, compared to the alternative, we're spending one-fifth of what it would have cost on a mainframe and would have taken 10 times longer to implement."

Practically zero effort

The completed network's speed and performance has exceeded expectations, even surpassing the prior human resources system on a mainframe, Kustoff said. Unlike a mainframe, the effort required to operate and maintain the network is "practically zero," he added. "I am absolutely sure that this system is the model for the future. Mainframes will be used to tie systems like this with others."

He called it "a classic end-user computing solution," one that was developed and operated by an end-user department that had a thorough understanding of the application and the technical knowledge to install, operate and maintain a system of this magnitude.

"At the time, our MIS department did not have the in-house expertise to offer micro and networking support, and that forced us to be self-sufficent," Kustoff said.

The system, which was up and running in nine months, impressed management so much that Kustoff has been charged with finding ways to apply the cost-effective technology in other areas of the company. Along with that mandate, his title was changed from human resources manager to senior manager of microcomputing.

"We plan to invest a lot more heavily in micros," said Don Pooley, director of advanced technologies at Rorer. He cautioned that while LANs offer significant benefits, they also pose challenges that must be carefully handled. "There is a need for an understanding of security and backup issues and the integrity of data when taking corporate data from the mainframe and dishing it out," Pooley said.

There is also a critical need to establish and adhere to companywide standards on the networks that are to be used, he said: "We're doing over a billion in sales, and we had to get out of the mode where everyone was rolling his own and into acting as one cohesive unit."

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OS/2

CONTINUED FROM PAGE 37

will be biased toward OS/2," said Mike Natan, director of technology development. "But any investment will have to support a coexistence with DOS."

"We will have DOS until around 1996," Holmes said. "It will be desirable to have those applications look as much as possible like OS/2. Windows is the only hope." Among early adapters, hope for a smooth transition from DOS to OS/2 lies largely in Microsoft's Windows. Windows is seen as a way to leverage DOS investments until Presentation Manager applications drive users to OS/2.

Even as they wrestle with development, the problem of cost-effective support worries managers. For large organizations, the only solution is disciplined standards.

Technology that has been approved at Bank of America includes four hardware platforms and three types of local-area networks. With approved core software products and the number of users, that still leaves almost a million possible configurations of workstations.

KFC's Jones

"OS/2 only complicates that issue, and we are rapidly approaching the time when we will need artificial intelligence to handle diagnostics," said Arnold Birenbaum, vice-president of end-user computing at Bank of America. "We are already taxing our available support methods."

Toward five figures

Beyond the cost of the software, OS/2 requires sizable investments in Intel Corp. 80386-based PCs, bringing most workstations into the $5,000 to $10,000 range. Financial constraints may prove to be the most intractable problem. Coercing decentralized business managers to spend their money on OS/2 with no concrete productivity boost is an uphill battle.

"It is enormously expensive, and internal business partners buy solutions," Birenbaum said. "I understand from a technical point of view that the transition is necessary, but I don't know when the value will be there."

The California Banking Division of Bank of America has already begun a number of pilot projects and is committed to OS/2 as a strategic goal. Giving users the incentive to move at all takes an imaginative approach to financing the aquisition of the new technology. The bank uses a combination of direct and indirect charges for IS services, depending on who controls the business area's IS budget and how critical corporate management considers the move.

For example, if the business area controls its own budget and corporate management considers the migration important, it can expense the migration charges at the division level.

In smaller companies, however, that type of flexibility often does not exist. Typical is the situation of Bill Hinkle, information center manager at Western & Southern Life Insurance Co., a Cincinnati-based regional insurance company. "We tell [business managers] what to get, but they decide if they are going to pay for it," Hinkle said. "Most are not sure they need it. It is extremely hard to control."

Jones credits Microsoft with helping to get the chain's applications up early. Microsoft recently made OS/2 Release 1.1 available to KFC. The added functionality will enable implementation of more sophisticated point-of-sale networks.

With responsibility of 14,000 PCs, Birenbaum believes that staying ahead of the technology curve makes placing a bet on OS/2 worthwhile for Bank of America.

"We are investing heavily now, but this is going to be the lifeblood of our company," he said. "You can't change an infrastructure of this size often. We have to make this move to stay competitive for the next 10 years."

Abortion

CONTINUED FROM PAGE 39

mailing lists. Both groups turn to direct mail companies to do their mass mailings.

Apart from some informal information systems consulting from the national organizations, state groups are left on their own. For example, the Texas Abortion Action League in Austin uses an Apple Computer, Inc. Macintosh II. "The computer was a peripheral instrument in the office, kind of a fun tool when we bought it two years ago," said Pat Kubala of the Texas group. "Now it's part of our working day, and we can't get by without it."

Kubala's counterpart, Kathie Robert, the administrative director of the Texas Right to Life Committee, credited her husband, whom she describes as a hacker, as having helped her save money by writing applications for the programs that run on her PC XT and AT clones.

"We're looking at using [Microrim, Inc.'s] R:Base for keeping track of literature, quotes, printed and audio/video material . . . a sort of library index," said National Right to Life's Ohlhoff. He added that while the group has purchased some specialized adaptations to programs such as Microrim's package, "in most cases we're generating our own internal software."

Now that the abortion debate has moved from the judicial to the legislative arena, activists on both sides may need to respond faster to events.

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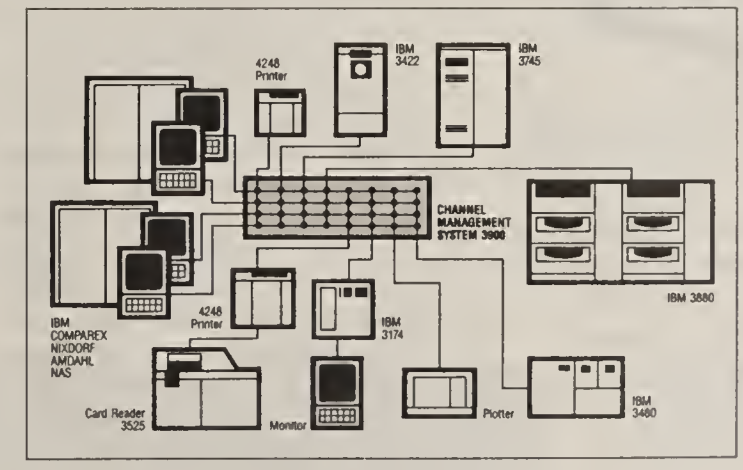
Easy online expansion and maintenance	YES	NO	NO
PC-based control system	YES (standard)	YES (optional)	NO



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NEW PRODUCTS

Systems

A "notebook" computer reportedly about the size of a 1-in. stack of paper has been introduced by Zenith Data Systems.

The Minisport is said to be a full-featured personal computer that weighs 5.9 pounds and has a removable battery. According to the company, features include a 2-in. floppy disk drive with 720K-byte disks as well as a screen that incorporates both transmissive and reflective technologies and can be adjusted for varying light conditions.

The Model 1 with 1M byte of random-access memory sells for $1,999; the Model 2 with 2M bytes of memory sells for $2,799.

Zenith Data Systems
1000 Milwaukee Ave.
Glenview, Ill. 60025
800-553-0331

A portable IBM Personal Computer-bus computer, built to industrial standards, has been announced by Texas Microsystems, Inc.

The Model 6010 reportedly operates from a variety of AC and DC power sources, including the battery of any gas- or diesel-powered vehicle, and was designed to withstand rough handling. According to the company, the unit measures 15½ by 14½ by 6 in. when the keyboard and display screen are stored for transport and has 10 positions on the backplane suitable for IBM PC XT, AT or compatible function cards.

Hundred-unit prices start at $7,000 each, depending on options.

Texas Microsystems
10618 Rockley Road
Houston, Texas 77099
713-933-8050

Software applications packages

A graphics package that permits Lotus Development Corp. users to put 20 graphs on one page has been introduced by Intex Solutions, Inc.

Graph/Array reportedly allows the user to use Lotus-style menus to define data from Lotus spreadsheets, select graph styles and lay out pages. Settings can be saved for future use.

The product is compatible with Lotus' 1-2-3 Versions 2.0, 2.1 and 2.2. The dot-matrix printer version of Graph/Array lists at $95, while a Hewlett-Packard Co. Laserjet Plus or Series II printer version costs $145. On Sept. 30, prices are set to rise to $145 and $195, respectively.

Intex Solutions
161 Highland Ave.
Needham, Mass. 02194
617-449-6222

Structural Research and Analysis Corp. has announced geometric modeling software developed to generate finite element models for the company's Cosmos/M finite element analysis program.

Called Geostar, the software reportedly runs on Intel Corp. 80286- and 80386-based machines as well as Apple Computer, Inc. Macintosh II computers. The three-dimensional program permits object modeling using parametric primitives such as curves, surfaces and volumes, the firm said.

Loads and boundary conditions can be graphically applied on either the geometry or at the nodes, and surfaces can be highlighted in different colors, the company said.

Geostar is priced from $1,000.

Structural Research
Suite 100
1661 Lincoln Blvd.
Santa Monica, Calif. 90404
213-452-2158

Software utilities

Quicksoft, Inc. has announced a file-scanning and hypertext tool for the IBM Personal Computer and compatibles.

PC-Browse reportedly lets the user view files, search them for information, link them together in hypertext fashion and perform some file management tasks. According to Quicksoft, the tool permits information in the files to be printed or pasted into the host application and has several search capabilities and customized hot keys.

Said to require 60K bytes of free random-access memory, the program runs under DOS 2.0 or above and requires a 3½- or 5¼-in. floppy disk drive. PC-Browse is shareware with registration retailing at $49.

Quicksoft
219 First Ave. N., No. 224
Seattle, Wash. 98109
206-282-0452

Macintosh products

Tektronix, Inc. has introduced a computer-aided chemical modeling system reportedly based on the Apple Computer, Inc. Macintosh IIX platform.

The Cache Worksystem, developed by a team of chemists at Tektronix Laboratories, provides solutions for synthetic organic chemists using computational chemistry and computer graphics, the company said. The system incorporates a proprietary applications accelerator board, a graphics board with three-dimensional capabilities and a stereo monitor with removable shutter. The Cache Worksystem is priced under $40,000, the vendor said.

Tektronix
P.O. Box 500
Beaverton, Ore. 97077
503-627-7111

Altsys Corp. has upgraded its Adobe Systems, Inc. Postscript font generation, logo designer and graphics editor software for the Apple Computer, Inc. Macintosh.

Version 3.0 of Fontographer reportedly features an autotrace tool, automatically generated hints, an integrated bit-map font editor and user interface improvements.

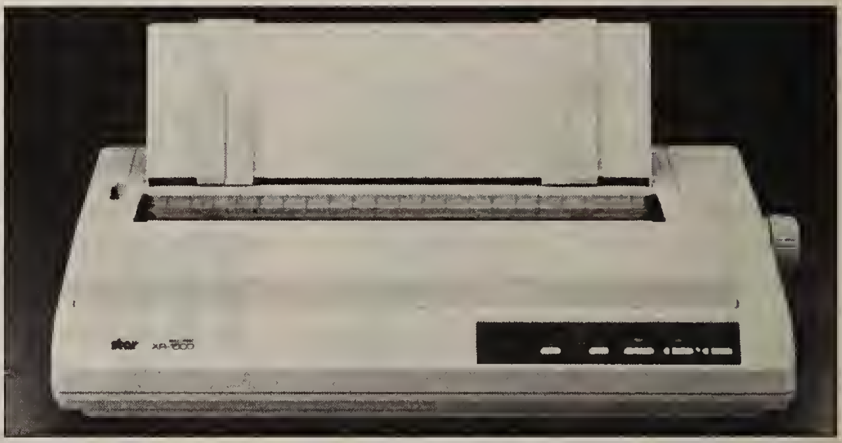
The retail price is $495, but an upgrade to registered users who purchased the program before April 1 is available for $70. Users who purchased programs after April 1 will be upgraded for $20.

Altsys
Suite 109
720 Avenue F
Plano, Texas 75074
214-424-4888

A dot matrix printer aimed at the low-end of the printer market has been announced by Mannesmann Tally Corp.

Priced at $229, the MT81 printing device reportedly offers a bidirectional draft speed of 130 char./sec. and both standard friction and tractor-feed paper-handling functions. The standard configuraton includes IBM Proprinter and Epson America, Inc. FX 80/85 emulations. A one-year warranty is provided.

Mannesmann Tally
8301 S. 180th St.
Kent, Wash. 98032
206-251-5500


Star Micronics America's *XR-1500 Multi Font printer*

Peripherals

Star Micronics America, Inc. has introduced a pair of dot matrix printers that each feature eight resident fonts, according to the company.

The XR-1500 Multi Font with a 15-in. carriage and the XR-1000 Multi Font with a 10-in. carriage are reported to be nine-wire units that can also produce multicolor output using an optional color-printing kit, the firm said.

Both devices offer 300 char./sec. in draft-elite mode and 75 char./sec. in near-letter-quality mode, the vendor said.

The XR-1500 costs $799, and the XR-1000 sells for $579.

Star Micronics
Suite 3510
200 Park Ave.
New York, N.Y. 10166
212-986-6770

Hewlett-Packard Co. has announced a tabletop impact dot matrix printer that prints draft-quality documents at 420 line/min.

According to HP, the HP 2562C is geared for high-volume environments in which 25,000 pages per month are handled and is supported on the HP 1000, HP 3000 and HP 9000 computer systems. Using the HP-PCL printer command language, the HP interface bus is said to be standard, and the RS-232C, RS-422 and Genicom Corp. Centronics parallel interfaces are optional.

The price is listed at $5,500, according to the company.

HP
19310 Pruneridge Ave.
Cupertino, Calif. 95014
800-752-0900

Board-level devices

NEC Home Electronics, Inc. and Lotus Development Corp. have announced an agreement under which NEC will reportedly manufacture and distribute read-only memory (ROM) card versions of Lotus software for the Ultralite, a recently introduced NEC laptop computer.

NEC will manufacture a ROM card version of Lotus' 1-2-3 Release 2.01 spreadsheet software and Lotus' Agenda Release 1.0 personal information management software, the company said.

Under the agreement, Lotus will handle final product assembly and packaging.

The 1-2-3 ROM card will carry a suggested retail price of $495, and the Agenda Ultralite product will cost $395.

NEC Home Electronics
1255 Michael Drive
Wood Dale, Ill. 60191
312-860-9500

A binary image compression and expansion board designed for use with the IBM Personal Computer AT has been announced by Rapid Technology Corp.

The DCE-400 board was developed for image processing users who require storage, archiving and transmission of large files generated by high-resolution scanners, the vendor said. The product reportedly reduces file size by as much as 20 to 50 times and can accommodate images as much as 32,752 pixels wide. It is priced at $695.

Rapid Technology
54 Ballard St.
Newton, Mass. 02159
617-244-7879

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Jon Bayless

Unix and OSI a good blend

Because of a time coincidence in their development histories, the Unix operating system and Transmission Control Protocol/Internet Protocol (TCP/IP) communication protocols are frequently presented as a single solution to two different problems: portability of applications between computer systems supplied by different manufacturers and communications in a heterogeneous computer environment.

However, Unix and TCP/IP are not interdependent. Unix can be an ideal base for other commercial models — for example, the International Standards Organization's (ISO) Open Systems Interconnect (OSI). Unix has been used extensively in TCP/IP products and applications, and the OSI world has

Continued on page 47

Inside

- EDI nets are venturing out and seeing the world. Page 46.
- CUA developer's tool kit shepherds DOS-based machines into the SAA fold. Page 47.

Previewing pix with ISDN link

ON SITE

BY ELISABETH HORWITT
CW STAFF

NEW YORK — Eager to extend its Integrated Services Digital Network (ISDN) services into the U.S., France Telecom recently had *Time* magazine test an application that allowed the publication's editors to preview photograph databases at two major French press agencies before downloading their final choices over a trans-Atlantic ISDN link.

However, while *Time* expressed a cautious interest in the service, the pilot pinpointed several technical and business-related obstacles that still must be overcome before such an application becomes feasible in the U.S.

The application, which already exists as a commercial service in France, allowed *Time* photography editors to access an IBM Personal Computer-based database server that resides at a French press agency and download screens with as many as 16 low-resolution photos to their own PCs for viewing. Once they had chosen which photographs they wished to purchase, the editors could either download the photographs in high-resolution form over a high-speed link or have them delivered by courier, a France Telecom spokesman said.

Time frame

Time already transmits high-resolution photographs from its own offices around the world via a high-speed satellite link, according to *Time* picture editor Michele Stephenson. However, such links cannot transmit low-resolution pictures, and downloading high-resolution photographs via satellite would be too costly and time-consuming, she added. Instead, *Time* gets a description of the various choices over the telephone.

France Telecom's ISDN service promises a more cost-effective way for companies such as *Time* to preview photographs both at their own remote sites and at press agencies around the world, according to Marc Montagner, director of business de-

Continued on page 47

Net mart hoppin' along

But saturation expected to cause slowed buying

BY RICHARD PASTORE
CW STAFF

Escalating user need for multivendor network management will add up to a $623 million network management market in Western Europe by 1992, with IBM and Digital Equipment Corp. as the dominant suppliers, according to a study by London-based Frost & Sullivan Ltd.

However, by 1993, the study said, the market will decline to $548 million, thanks to market saturation and a lull in buying as users await the emergence of new standards.

The strategic importance of sharing information, particularly in light of the 1992 relaxation of European trade barriers, is driving demand for management of Europe's 15,000 to 20,000 multivendor private networks, according to the study.

The greatest percentages of market growth by 1993 (see chart) are expected in West Germany (266%), Italy (242%) and France (203%).

"Right now, 25% of the network management market is in the UK, which is the most liberalized country," said Robin Bosworth, the study's author.

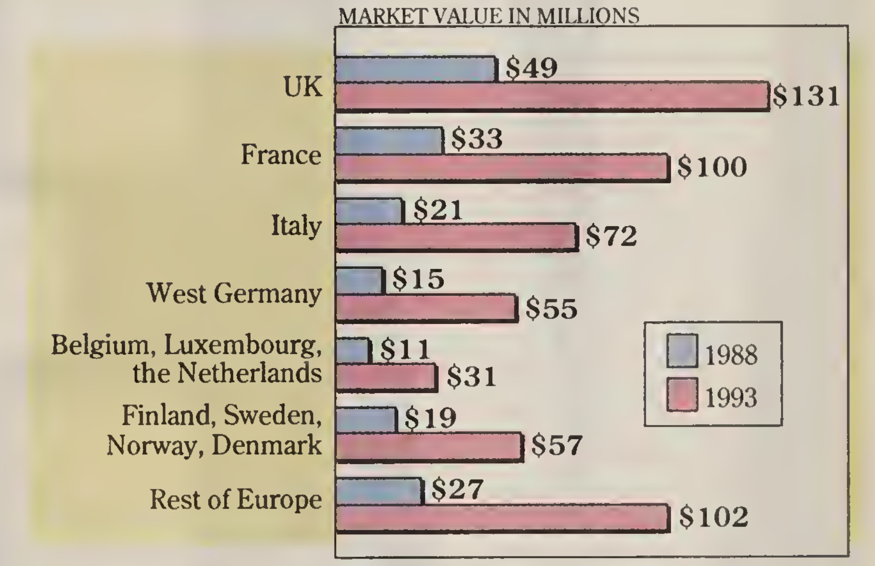
The market projections were based on vendor sales data for nine product and service categories, including modems and low-speed multiplexers, host-based software, supervisory systems, services and dedicated network management systems.

The largest product sector of the market (37%) will be host-based software, led by IBM's Netview and DEC's Enterprise Management packages, according to the study.

Vendors eyeballing this juicy multivendor network management pie must overcome significant obstacles besides their natural aversion to openness, however. "The European countries differ so much in government policy in what is provided and what you're allowed to do. It makes it very difficult to standardize across Europe," Bosworth said.

Big bucks in linking Europe

Western Europe should represent a $548 million market for network management equipment and services in 1993



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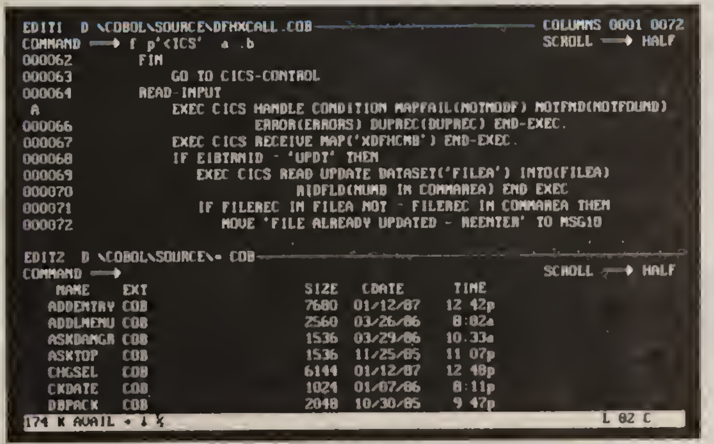

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EDIT1  D \COBOL\SOURCE\DFHXCALL.COB ---------------------- COLUMNS 0001 0072
COMMAND ---> f p'<ICS'  a .b                                SCROLL ---> HALF
000062          FIN
000063              GO TO CICS-CONTROL
000064          READ-INPUT
 A                  EXEC CICS HANDLE CONDITION MAPFAIL(NOTMODF) NOTFND(NOTFOUND)
000066                        ERROR(ERRORS) DUPREC(DUPREC) END-EXEC.
000067              EXEC CICS RECEIVE MAP('XDFHCMB') END-EXEC.
000068              IF EIBTRNID - 'UPDT' THEN
000069                 EXEC CICS READ UPDATE DATASET('FILEA') INTO(FILEA)
000070                           RIDFLD(NUMB IN COMMAREA) END EXEC
000071                IF FILEREC IN FILEA NOT - FILEREC IN COMMAREA THEN
000072                   MOVE 'FILE ALREADY UPDATED - REENTER' TO MSG10

EDIT2  D \COBOL\SOURCE\- COB ---------------------------------
COMMAND --->                                                SCROLL ---> HALF
   NAME     EXT                     SIZE   CDATE      TIME
  ADDENTRY COB                      7680  01/12/87   12 42p
  ADDLMENU COB                      2560  03/26/86    8:02a
  ASKDANGR COB                      1536  03/29/86   10.33a
  ASKTOP   COB                      1536  11/25/85   11 07p
  CHGSEL   COB                      6144  01/12/87   12 48p
  CKDATE   COB                      1024  01/07/86    8:11p
  DBPACK   COB                      2048  10/30/85    9 47p
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EDI nets seeping into worldwide use

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — Following the patterns of international trade, electronic data interchange (EDI) is going global. EDI networks are already in widespread use, but they are scattered among geographic centers in the U.S., Europe and Japan.

The challenge for value-added EDI suppliers, said speakers at an Input, Inc. conference here last month, is to combine these into some kind of standardized, coherent network. Those suppliers are now operating in a global environment in which there are many local de facto standards. True worldwide standards remain years away.

One of the many companies working toward global EDI is Los Angeles-based Infonet, Inc., which is expected to make a global product announcement this fall. "Our customers are multinational," said Laura Andrus, Infonet's director of marketing. "They have applications that require local support in the local time zone and in the local language."

Infonet has been providing international electronic services since the 1970s, according to Andrus. Recently, however, it has been building an infrastructure that would tie the geographically dispersed offerings together. The product offering hinges on dozens of agreements with companies that agree to provide regional support, Andrus said.

The removal of trade barriers in Europe in 1992 is spurring EDI vendors there to cross-link value-added services, including electronic funds transfer, said Tim Stevens, managing director of Input's EDI program for Europe. He estimates that the EDI market should jump from the current level of $30 million to $270 million by 1994.

Developing in Japan

The Pacific Rim is another arena for EDI, said Victor Wheatman, manager of Input's electronic data exchange program. "Japan is just starting to appreciate the concept of EDI," Wheatman said. "There are EDI standards in Japan, although they are not compatible with North American standards."

Even so, he added, there are already some agreements in place for Japanese-North American EDI.

EDI, which started as a terminal-to-mainframe interchange between large manufacturing firms and their suppliers, is beginning to move toward enhanced, value-added services provided by third parties, Wheatman said.

Among the prime competitors are GE Information Services, Telenet Communications Corp., McDonnell Douglas Computer Systems Co.'s Tymnet and Sterling Software, Inc.'s Ordernet.

However, any move toward universal service will await the further definition of EDI standards and the addition of more security features, conference speakers said. Active users are leveraging EDI to deal with 180 or more suppliers, Wheatman said. Many are in the retail merchandising, automotive and aerospace industries, in which EDI replaces paper transactions. But many potential users appear to be waiting for more standards before launching full-fledged EDI programs.

EDI pilots

An Input study this spring tracked 100 active users but found that many are still running pilot projects. "About one-third of the users we surveyed are now involved in using, piloting or actively planning EDI for electronic funds transfer implementations," Wheatman said.

Universal use of EDI, while envisioned, is still far off, Input speakers indicated. "Our forecast for 1989 suggests that we will see a 45% growth rate for this year," Wheatman said. "This is still a very attractive marketplace, but we were looking for something a little more dramatic."

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CUA tool kit boasts quasi-fountain of youth

BY PATRICIA KEEFE
CW STAFF

LAGUNA HILLS, Calif. — Network Software Associates, Inc. (NSA) has introduced a developers tool kit said to extend the life of MS-DOS personal computers by aiding the development of IBM Systems Application Architecture/Common User Access (SAA/CUA) applications. It provides DOS applications with LU6.2 and the same features and interfaces as IBM's memory-intensive OS/2 Extended Edition.

The AdaptSNA CUA Toolkit does this by generating DOS-based graphical user interfaces that conform to the CUA specifications of IBM's SAA, eliminating the need and expense of doing CUA coding from scratch.

IBM is promoting SAA/CUA as a cost-saving blueprint for developing consistent applications across multiple platforms, particularly 370 mainframes, Application System/400 minicomputers and Personal System/2s running OS/2, said Raymond Chan, NSA's vice-president of sales and marketing. However, that support does not extend to DOS.

This does not sit well with many users who intend a slow migration to OS/2 Standard Edition. Even for users who plan to move over to Officevision, DOS remains a key system.

"We have about 700 PCs, and almost all are still using DOS," said Kevin Hunter, a project supervisor of microcomputer applications at Maryland Casualty, a Baltimore-based insurance firm. Hunter added that DOS can still serve the needs of 60% to 70% of his users.

Users seeking to adhere to SAA tenets said they want to extend the same look and feel from their IBM mainframes down to the masses of DOS-based PCs blanketing their installations.

"There's no way that we will migrate everyone to OS/2," said a member of the corporate information systems staff at a large systems integrator. Only power users with special needs, such as graphical interfaces, communications or multitasking, are being moved to OS/2 at his site.

These users said they have rejected IBM and Microsoft Corp.'s OS/2 Presentation Manager, IBM's Easel and Microsoft's Windows as avenues for achieving top-down look and feel. Easel, according to Hunter, is really for OS/2, not DOS.

Window pain

One of the problems with developing applications under Windows is that none of the major IBM 3270 vendors — IBM, Attachmate Corp., Digital Communications Associates, Inc., and others — has produced 3270 packages specifically for Windows, said Hunter, who is currently developing an executive workstation that requires 3270 emulation sessions. His site has more than 3,000 terminals.

NSA's tool kit fills this niche by giving DOS-based LU6.2 and 3270 applications the same look and feel as OS/2 Extended, the company claimed. When users are ready to migrate to OS/2, they will not have to be retrained because the interface is the same, Chan added.

The software will bring OS/2-consistent screen displays and mouse support into DOS-based connectivity applications, which then gain the same look and feel as though they were running under Presentation Manager.

"SAA supports Windows and PM, but IBM doesn't directly support text-based interfaces," the integrator's staffer said.

A primary concern for the systems integrator is the amount of memory consumed by the developed interface. "For a lot of the applications that we need to write, we need something that is compact — small in code — and that will still give the user an interface as close as possible to SAA," he said.

Most of the DOS packages, such as Windows and The Oakland Group's Cscape, allow developers to write applications using a graphical user interface in text mode, but these programs consume more than 400K bytes of random-access memory, the systems integrator's spokesman said. "We want to produce an application that is closer to 200K to 300K of RAM."

The tool kit is used in conjunction with any of five LU6.2 AdaptSNA products.

The DOS applications generated by the software can run on stand-alone or networked PCs and PS/2s and reportedly can use all major Systems Network Architecture protocols. Priced at $695, the tool kit will be available in the fourth quarter, the firm said. AdaptSNA products start at $285.

ISDN

FROM PAGE 45

velopment at France Telecom.

While satellite links require expensive, dedicated connections that must be set up in advance, ISDN provides dial-up digital 56K or 64K bit/sec. connections, on an as-needed basis, to any other site that also has an ISDN or digital dial-up access, he added.

Users also need a special PC workstation with a high-resolution screen from Image Directe, a French vendor with a New York office.

France Telecom's international ISDN connection, which runs between France and New York over the TAT-8 transatlantic cable, is priced at $2 per minute, or about twice as much as ordinary dial-up overseas connections, Montagner said. It took 15 seconds to download a high-resolution photograph from a Parisian agency to *Time's* New York office, he added.

Time would be interested in France Telecom's service, but only if the carrier could provide dial-up ISDN links to a variety of press agencies around the world, Stephenson said.

By early 1990, France Telecom expects to provide ISDN services to a variety of European countries, through agreements with various Postal Telephone and Telegraph authorities, Montagner said.

However, true ISDN connections to the U.S. could take a little longer. The *Time* pilot actually used AT&T's Switched Digital International service at the U.S. end, because an international ISDN connection between France Telecom and AT&T is not scheduled to be available until this fall.

Even then, U.S. companies will have to wait for former Bell operating companies such as New York Telephone to provide ISDN services on the local loop, Montagner indicated. However, 56K bit/sec. switched-digital services work just as well for the application, he added.

Time's Stephenson brought up one other potential obstacle to a worldwide photograph transmission service such as the one France Telecom has in mind: the fact that press agencies are highly competitive and unlikely to agree to having their databases accessible over a public dial-up network, "where other [agencies] could grab them, and some newspapers could reproduce them."

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Bayless

FROM PAGE 45

been increasingly adopting Unix as a base.

In fact, Unix should be considered as the "normalized" operating system environment for attachment of ISO standard protocols.

In its definition, the ISO reference model includes layers to standardize the representation of information between disparate end systems and to provide compatible access to end-system services. Because it is an open operating system, Unix is an ideal choice for this normalization standard.

For instance, every OSI implementation could begin with the assumption that the far-end system provides a Unix environment. With Unix representing the normalization standard, the ISO stack could be truncated or abbreviated when resident on a Unix platform.

Thus, a close coupling between Unix, the open operating system and the ISO worldwide standard communication protocols could enhance performance.

Unix is well suited to provide an entire range of OSI-based services through a single operating system. There are several advantages to implementing Unix as an OSI platform, three of which are cited below.

The first advantage is that Unix can support a multitasking, multiprocessor environment such as those found in the OSI application layers. For example, multiple users can run on the same processor, which would be ideal for an X.400 implementation.

In addition, Unix's availability over a wide range of workstations, mini and mainframe computers gives the user a large selection of equipment to choose from. There are several vendors that manufacture Unix processors such as AT&T, Data General, DEC and Unisys.

Lastly, Unix has a large, installed base in the scientific community, is widely used in government applications and is becoming increasingly popular in the commercial world. Unix has already been accepted as a base for OSI in government applications.

For example, the government has made Posix a Federal Information Processing Standard, requiring that all Unix operating systems for government procurement conform to Posix.

Following suit

The commercial market should soon follow suit. Dataquest predicts that by 1993, Unix will be the main operating system for 87% of the worldwide computer market, defined as all business and technical computers ranging from technical workstations to supercomputers.

There is, however, a downside associated with such a close coupling between a standard operating system and communications protocols.

For example, it is tempting to employ operating system calls to provide a short cut to protocol implementations. But because of operating system overhead, this approach can be very expensive in terms of communications throughput.

To achieve optimum performance, even when assuming a standardized operating system environment, careful attention must be given to partitioning the protocol processing tasks and identifying the time-critical elements in the interaction between the communication protocols and the operating system.

This type of analysis is best performed by specifying and analyzing the details of the communications protocol within the context of a standard operating system environment.

As Unix becomes the preferred computer operating system, more OSI implementations will be able to take advantage of its benefits.

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Vendors vie to be king of Token-Ring

BY PATRICIA KEEFE
CW STAFF

While users continue to watch from the sidelines, the contest of one-upmanship has escalated in the emerging 16M bit/sec. Token-Ring arena.

IBM was first out of the blocks last November, christening the market with a 16M-bit offering strictly for shielded twisted-pair cabling, or Type 1. Many users were not pleased, as they want to use unshielded twisted-pair cabling, or Type 3, which IBM claims is impractical.

Ungermann-Bass, Inc. followed up IBM's introduction May 31 by proposing to extend 16M bit/sec. Token-Ring support to the cheaper telephone wire. However, UB's network will not ship until the third quarter of 1990.

Tiny Westboro, Mass.-based Proteon, Inc. recently managed to sting both Goliaths with plans to release this month a modular hub said to support 4M, 10M and 16M bit/sec. networks over unshielded and shielded twisted-pair cabling.

Support for the 16M bit/sec. speed is tentatively slated for fall, depending on when Texas Instruments, Inc. is able to deliver its much-delayed 4M to 16M bit/sec. chip set in quantity. Proteon will add support for fiber optics in the future.

So far, only IBM is actually shipping a product — a combination 4M and 16M bit/sec. card. International Data Corp., a market research firm based in Framingham, Mass., estimates that the number of sites using that card for 16M bit/sec. data transmission is quite low. This is expected to change next year, as users gain choices in suppliers and cabling types once they get past the pilot stage.

Proteon, which first demonstrated its product at Comdex/Fall '88, unwrapped network adapters and the Series 70 intelligent wire centers, which feature unified media support and network management capabilities using an out-of-band communications channel. The Series 70 supports up to 72 devices over both AT&T's Premises Distribution System and IBM's Cabling System and will work with IBM cards using a media filter.

Proteon and UB are taking different approaches to surmount attentuation problems related to unshielded twisted-pair cabling. UB is using active encoding between the wire center and adapters, which allows modification of the signal being transmitted. This method will drive a signal up to 100 meters, according to Courtin.

Proteon chose the passive filtering route, which Courtin claimed is also the cheapest and the simplest. It modifies the energy level of the signal by sending it through a filter, uses no active electronic components and works best over distances up to 85 meters. He said this distance is sufficient for 99% of existing workstations.

Proteon and AT&T hope to make the passive method a standard for supporting 16M bit/sec. unshielded twisted-pair cabling and want to see it incorporated into the IEEE 802.5 standard.

Novell signs 3-way retail agreement

BY CHARLES VON SIMSON
CW STAFF

PLEASANTON, Calif. — In an effort to simplify local-area network server software sales while also further consolidating its distribution channels, Novell, Inc. recently signed a three-way retail act with Computerland Corp. and Compaq Computer Corp.

The agreement, which ends months of speculation — and denials — will result in a range of preconfigured servers marketed as The Network Edge.

This will allow Computerland dealers to order a single part number for Compaq personal computers configured with the random-access memory and hard-disk storage necessary to run preloaded configurations of Novell's Netware network operating system software.

Training wheels

Novell will supply technical and sales training for Computerland dealers nationwide. The program will include four configurations of Netware, spanning the full range of the product line.

Although the marketing agreement will clearly strengthen the retail presence of Novell, it also will enable the vendor to continue its effort to consolidate its distribution channels.

Over the past year, Novell's sales through large distributors have doubled to 60% of total revenue, and retail sales have grown from 8% to 12%, according to Don Rainey, Novell's national retail manager. During the same period, percentage sales by small dealers and OEMs have decreased.

The agreement with Computerland will make it more difficult for small dealers to maintain competitive pricing on basic software.

Sources at Novell said the company will continue to eliminate smaller, less profitable dealers and OEMs in order to increase distribution control.

Rainey predicted the deal will benefit users of larger networks.

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AT&T To Spotlight 11 ISDN Appli

NEW PRODUCTS

Local-area networking hardware

Solbourne Computer, Inc. has added multiprocessor server models to its line of Sun Microsystems, Inc.-compatible products.

The two servers, the Series 4/530 Workgroup Server and the Series 4/670 Departmental Server, are said to be binary-compatible with Sun's Sparcserver 300 family and will accommodate Solbourne and Sun products, as well as personal computers and various terminals. The Workgroup Server is reportedly a five-slot under-desk processor unit that houses one or two Sun Scalable Processor Architecture (Sparc) processors for up to 17 million instructions per second (MIPS) computing power and 16M to 40M bytes of memory. Prices begin at $23,200.

The Departmental Server is a 14-slot deskside unit that houses up to four Sparc servers for up to 30 MIPS of computing power and from 16M to 80M bytes of memory, the company said. The prices begin at $36,700.

Solbourne Computer
1900 Pike Road
Longmont, Colo. 80501
303-772-3400

Davox Corp. has added a data controller and an autodial system to its line of communications hardware products.

The Communications Resource Server (CRS) was reportedly designed for use with Davox Series 4900 and 5900 multifunctional windowing voice/data workstations.

In addition to standard controller features, the CRS is said to offer multihost support plus automated forms and real-time statistics packages. The controller can maintain eight synchronous and 32 asynchronous simultaneous sessions, according to the vendor. A typical 16-user configuration sells for approximately $15,000.

According to the company, the entry-level Computerized Autodial System (CAS) 500 was designed for lower volume outbound calling operations such as smaller collection agencies. Said to automate manual tasks associated with dialing and call-list management, the CAS 500's pricing starts at $50,000 for a six-line, three-agent system.

Davox
3 Federal St.
Billerica, Mass. 01821
508-667-4455

Gandalf Data, Inc. has unveiled a wire-based Ethernet connection for large numbers of personal computers.

The Starpair system reportedly connects from five to more than 500 PC users in an Ethernet local-area network that operates at 10M bit/sec. and supports unshielded twisted-pair wire, coaxial cable and fiber-optic cable.

According to the company, as part of a Gandalf Starmaster-based hybrid network, the Starpair system provides centralized management capabilities with the transport media control console being accessed from any PC or Digital Equipment Corp. VT100 and VT200-compatible terminal on the network.

Prices range from $550 to $700, depending on configuration, the vendor said.

Gandalf Data
1020 S. Noel Ave.
Wheeling, Ill. 60090
312-459-9348

Local-area networking software

South Mountain Software, Inc. has released Essential Communications Version 3, a library of C communications software.

Version 3.0 reportedly communicates with other personal computers, mainframes, plotters or other devices that use the RS-232 port and provides interrupt-driven transmit and receives up to 115K bit/sec. on up to 34 ports. The software reportedly supports a variety of file-transfer protocols and digiboards — Stargate Technologies, Inc.'s Plus8, AST Research, Inc.'s Four Port/DOS and IBM Personal System/2 asynch adapters — and has a generic multiport driver.

Source code and documentation with examples are priced at $249.

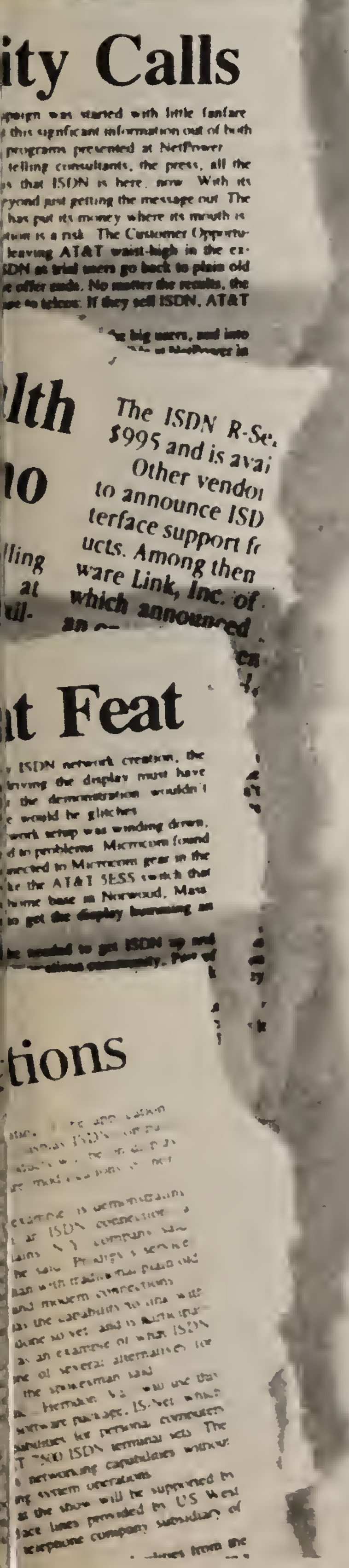
South Mountain Software
Suite 3
76 South Orange Ave.
South Orange, N.J. 07079
201-762-6965

Interconnections, Inc. has announced software that allows personal computer workstations on Novell, Inc. Netware local-area networks to log in and communicate with Digital Equipment Corp. VAX/VMS systems on Ethernet LANs.

Called Terminal Emulation Services (TES), the software reportedly allows the IBM Personal Computer and Personal System/2 workstations to emulate interactive terminals, such as the DEC VT220, log in to DEC VAX/VMS and run standard VMS applications. Supporting a variety of LANs, the software was released as an unbundled product last month, the company said. Pricing depends on the size of the DEC VAX CPU on which the TES server module is installed.

Interconnections
Suite 100
14711 N.E. 29th Place
Bellevue, Wash. 98007
206-881-5773

Scorecard
(Part 2)



Who's really putting ISDN on the map?
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You only have to scan the trade press to see who's the clear-cut ISDN leader. The company that helped build the standards for ISDN. The company that's helping local telephone companies turn the promise of ISDN into Real-World Solutions. The company: AT&T.

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So, while most other suppliers are still in product development trials, AT&T Network Systems is helping phone companies across the nation offer Real-World ISDN services right now. Services such as simultaneous voice and data transmission, high-speed facsimile and electronic mail—all over a single phone line. Services that utilize your existing telephone network to dramatically increase productivity and efficiency for businesses, from hospitals and insurance companies to investment, publishing and law firms.

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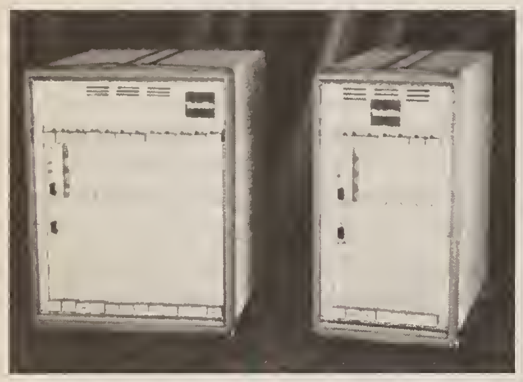
Links

Telefile, Inc. has unveiled a family of low-end, high-performance Digital Equipment Corp. VME bus X.25 packet switches.

The Tele-Switch Tower series offers a newly designed multifunction circuit board, the vendor said. The switches are packaged in a compact, vertical enclosure developed for office environments.



Telefile's *newly designed multifunction circuit boards*

The multifunction board reportedly provides 64K to 512K bytes of battery-backed static memory. According to the vendor, random-access memory can be specified up to 2M bytes. Performance characteristics include throughput of 1,150 to 1.7K packet/sec. based on a 128-byte packet size.

Pricing for the Tele-Switch Tower series ranges from $3,670 to $20,780, depending on model and number of ports required.

Telefile
17131 Daimler St.
Irvine, Calif. 92714
714-250-1830

A remote data acquisition control and communications interface designed specifically for the industrial automation and process control market has been announced by Connecticut Microcomputer.

Designated the DM16, the product reportedly provides 16 channels of user-assignable input and output, as well as an addressable serial interface for control of remote RS-232 and RS-422 devices.

The board is IBM Personal Computer- and Personal System/2-compatible and also supports Apple Computer, Inc. microcomputers.

The product is priced from $199 to $294, depending on configuration. Opto-isolation is also available.

Connecticut Microcomputer
P.O. Box 186
Brookfield, Conn. 06804
800-426-2872

Customer-premises equipment

Northern Telecom, Inc. has expanded its line of private branch exchange (PBX) terminals to be used with its Meridian SL-1 and SL-100 PBXs.

The additions reportedly include six sets plus modular options, a hands-free option and the ability to support six languages.

Modular options include a 2- by 24-character LCD, an asynchronous data module that provides an RS-232C interface to data terminals, an expansion key module that features 22 additional line and feature keys and a script-file procedure that allows users to access data via mnemonic names rather than telephone numbers, according to the company.

Basic prices range from the M2006 Single Line Digital Telephone at $115 to the M2016S Secure Telephone at $690, the vendor said.

Northern Telecom
200 Athens Way
Nashville, Tenn. 37228
615-734-4000

Globenet, Inc. and Renex Corp. have jointly announced the expansion of Globenet's data transmission services via a Renex IBM Systems Network Architecture-to-CCITT X.24 adapter.

The expansion reportedly provides customers with dial-up capabilities to IBM mainframe and midrange computers. Designed for IBM 3270 and 5250 applications running across packet-switched networks, the adapter will be available as customer premises equipment from Globenet. The Renex Connect controller device will handle line speeds up to 64K bit/sec. and can accommodate as many as 32 simultaneous calls, according to the vendor.

The product can be leased from Globenet for $50 per month per virtual port.

Globenet
5500 Cherokee Ave.
Alexandria, Va. 22312
703-658-4500

Network services

GE Information Services has implemented the Zmodem downloading protocol within its General Electric Network for Information Exchange (GENIE) consumer information service file libraries.

According to the vendor, Zmodem implementation reportedly has a 95% efficiency rate, is capable of recovering from a line disconnect because of call waiting or line noise and can function as a batch protocol.

Basic nonprime-time rates for GENIE service are $5 per hour for 300 bit/sec., $6 per hour for 1,200 bit/sec. and $10 per hour for 2.4K bit/sec.

The prime-time rate for all three speeds is $18 per hour. The sign-up fee for GENIE is $29.95, which includes a $10 usage credit, a user's manual and a subscription to GENIE's *Livewire* magazine.

GE Information Services
401 North Washington St.
Rockville, Md. 20850
800-638-9636

ITT Communications Services, Inc. has introduced 19.2K bit/sec. digital dial service for its private-line subscribers in 23 major U.S. cities.

The 19.2K bit/sec. service reportedly complements the 2.4K, 4.8K, 9.6K and 56K bit/sec. services already offered, enabling customers to design networks with a combination of digital transmission speeds.

ITT Communications Services
100 Plaza Drive
Secaucus, N.J. 07096
201-330-5453

Multiplexers

Rad Data Communications, Inc. has introduced the Megaplex-4, a T1 multiplexer designed to add data transmission capabilities to voice private automatic branch exchanges (PABX) and provide better utilization of the T1 trunk.

The product reportedly allows T1 and Conference on European Postal and Telecommunications (CEPT) transmission from voice PABXs and multiplexers to be combined with up to 10 channels. At the receiving site, the extra data streams are routed to the appropriate data, and voice channels and the initial T1 or CEPT frame is restored.

Megaplex-4 costs $6,600.

Rad Data Communications
151 W. Passaic St.
Rochelle Park, N.J. 07662
201-587-8822

Coastcom, Inc., a company specializing in T1 equipment for small- to medium-size T1 networks, has unveiled its D/I Mux III, an intelligent, high-capacity channel bank.

According to the vendor, the modular device reportedly can accommodate as many as 48 channels in a dual-channel bank mode and support fractional T1 in any configuration using less than 24 channels per T1 line.

The D/I Mux III unit is reportedly fully programmable and is available in five single- or double-height shelf configurations.

Pricing for the product starts at less than $3,000.

Coastcom
2312 Stanwell Drive
Concord, Calif. 94527
415-825-7500

Coastcom's *intelligent, high-capacity channel bank is fully programmable*

Diagnostic equipment

LP Com, a subsidiary of Tektronix, Inc., has upgraded its local-area network protocol analyzers for its TC 2000 multifunction and TC 1000 portable, single-function test systems.

According to the vendor, the TC 2000-B7 LAN protocol analyzer supports both wide-area network and LAN testing in the same system. The TC 1000-B7 is a dedicated portable LAN protocol analyzer.

Both protocol analyzers provide compatibility with Ethernet and the IEEE 802.3 standard, collision detection, a threefold increase in overall performance over the predecessors, as well as improved memory capacity, the company said.

The TC 2000-B7 is priced at 18,500, and the TC 1000-B7 sells for $15,600.

A board-only subsystem is available for $10,950.

Tektronix
LP Com Subsidiary
205 Ravendale Drive
Mountain View, Calif. 94043
415-967-5400

OS/2 networking

Metacomp, Inc. has introduced its PScomm2/4 intelligent serial I/O controller, designed for use with IBM's Personal System/2 Micro Channel Architecture series, the company said.

The product reportedly offers a choice of two or four programmable serial I/O communications channels for use with PS/2 Models 50, 60, 70, 80 and compatibles.

Features include 512K bytes of byte parity protected random-access memory, according to the vendor. The controller is priced at $1,395 for a two-channel version and $1,495 for a four-channel configuration.

Metacomp
Building A
15175 Innovation Drive
San Diego, Calif. 92128
619-673-0800

Network management

Emerald Systems Corp. has introduced Emlib, a network software application that provides tape archive management for large network environments, the company said.

Emlib is a member of the vendor's Ramp family of network data management software products and reportedly facilitates restore operations when backup savesets span multiple physical media or when several savesets are stored on one cartridge or cassette tape.

In addition, the software product maintains an on-line database of all backup sessions.

According to the vendor, Emlib operates with Emerald's 2.2G-byte Vast backup system. The software tool is priced at $395.

Emerald Systems
4757 Morena Blvd.
San Diego, Calif. 92117
800-553-4030

Optical Data Systems, Inc. (ODS) has introduced an Ethernet network controller that offers six levels of network management.

The ODS Ethernet Network Controller (ENC) module can reportedly diagnose and manage the network from a central location on the following levels: physical topology learning, performance monitoring, soft and hard error tracing, performance measurement, network control and automatic archiving of data. It is single-quantity priced at $2,200.

ODS
1226 Exchange Drive
Richardson, Texas 75081
214-234-6400

NEC America, Inc. has announced the SPN19275M, a stand-alone 19.2K bit/sec. diagnostic modem that provides network management.

According to the company, the modem features an internal dial-backup unit, automatic-speed fall back and fall forward, data branch and a six-port time-division multiplexer. The modem also has built-in capabilities that allow managers to monitor, test and control an entire modem network from the central-site modem.

The unit costs $7,495.

NEC America
110 Rio Robles
San Jose, Calif. 95134
408-433-1250

MANAGER'S JOURNAL

EXECUTIVE TRACK

Gregory A. Torski has been named corporate director of management information systems for **Town & Country Corp.**, a Chelsea, Mass.-based international jewelry manufacturer and luxury products retailer.

In the newly created position, Torski will oversee information systems at Town & Country's eight domestic and international firms.

Prior to joining Town & Country, Torski was director of product development for Softvision, Inc. He has also served as operations manager for midrange systems for Management Science America. Torski, who earned a bachelor's degree at Lehigh University and an MBA at Duke University, resides in Hingham, Mass.

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John C. Bolger has joined **Cisco Systems, Inc.** in Menlo Park, Calif., as chief financial officer. In that position, Bolger will be responsible for the company's MIS, control, treasury and human resources functions. Cisco is a supplier of multiprotocol internetworking products, including routers, bridges and terminal servers.

Bolger, 42, was previously at KLA Instruments Corp. in Santa Clara, Calif., where he served as vice-president of finance and administration. He has also worked at Monolithic Memories, Inc. and Datapoint Corp. He resides in Saratoga, Calif., and holds an MBA from Harvard University and a bachelor's degree from the University of Massachusetts.

....

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor-Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Good times roll for Kawasaki

After downshifting, company's IS group gears up dealer and sales networks

BY DAVID A. LUDLUM
CW STAFF

(From left) Shepard, Peterson and Bramwell *steer IS for Kawasaki*

Kawasaki Motors Corp. likes to call itself "The Good Times Company," but in 1977, the times were not so swell for the information systems organization at the maker of motorcycles, jet skis and all-terrain vehicles.

The IS group was not processing reports on time, and its systems frequently crashed; yet, with the head count at 95, management at the Irvine, Calif.-based company viewed the IS organization as overstaffed.

To deal with the situation, Kawasaki's vice-president of finance hired Robert O. Shepard, a burly ex-Marine who had been running data processing at Western Air Lines. Shepard, now a Kawasaki vice-president in charge of administration and information systems, set about reining in the IS organization. Today, the head count stands at 51, and the budget is only 25% above the level of 12 years ago, according to Shepard.

During those 12 years, Kawasaki revved up its IS infrastructure by building networks for its dealers and salespeople, among other systems. Last year, the company had its best year yet; motorcycle sales were up 5% in a market that shrank 20%, while watercraft sales rose 30%, according to Roger Peterson, the director of IS.

Kawasaki IS managers attribute much of the increase in motorcycle market share last year to a new service that lets dealers seek no-money-down financing for customers from Household Finance Corp. through Kawasaki's dealer network. A network link with Household Finance allows dealers to get nearly instantaneous responses on credit applications.

When he took over Kawasaki's IS organization, Shepard reckoned that about a third of his workers did not know what they were supposed to be doing. His message to them was to be patient team players. As he recalls, it went like this: "If nobody has the time to tell you what to do, just don't create more problems. We'll get to each and every one of you. However, if you're not interested in being a positive force in our organization and want to sit around and talk sports, do me and yourself a big favor and go look for a new job before I have to ask you to in about a month."

Although he already had too many people and too many managers, Shepard's first move was to hire another manager — Peterson, then a project manager in IS at Pacific Mutual Insurance Co. His job would be to plot a long-range strategy. "Ninety-five of us were going to right the ship," Shepard says, "and one — Roger Peterson — was going to learn the company so when it was righted we'd know which direction to sail in."

The reduction in head count took place over the next five years with only

Continued on page 56

College grads get edge over job shifters

BY ALAN J. RYAN
CW STAFF

"They don't make 'em like they used to." It has been said of many things, such as automobiles, beer cans and houses. Is it also true of recent college graduates in the information systems field?

Possibly, but there are some who argue that a recent college graduate is preferable to "the professional job changer."

Take James T. Matsey, for instance. As corporate director of information systems at Reynolds Metals Co. in Richmond, Va., Matsey says he has built a strong IS work force by bringing in recent graduates, providing them with additional training and then encouraging them to work on systems at one of Reynolds' nine businesses, spread over 40 manufacturing plants and 150 business locations in the U.S.

The selection process is still a careful one; Matsey is looking for technical skills combined with good business sense. He believes that where the schools have left a student weak in one particular area, education on the job will help.

"You can teach anybody who has a college degree," he says.

The biggest problem he faces with his training program — which happens under his supervision at the company's headquarters here — is trying to hold onto the workers until they have completed the training program, "before the demands of the company force us into putting them into other areas," he says. "I hire them and put them on my staff. We train them, and they get promoted to one of the professional staffs under me."

Matsey says the information systems industry is generally always looking for experienced people. For the last 11 years, however, Reynolds has been content to train its workers quietly while building their company loyalty.

"We have a good track record for holding onto those people," Matsey says, adding that he prefers to provide some training rather than hiring a job shifter who may change jobs every two years or so.

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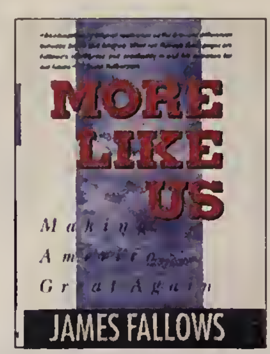
BOOK REVIEW

Making the case for beating Japan — the American way

MORE LIKE US
By James Fallows
Houghton Mifflin Co., $18.95

It is always somewhat startling at first to read a book that bucks the prevailing tide of opinion. Such points of view generally provoke one of two conclusions about the author — that he is a "visionary" or is just plain "off-base." Journalist/essayist James Fallows does just that in his new book, *More Like Us.* Fallows, a staffer at the *Atlantic Monthly* and frequent commentator for National Public Radio, has drawn an unusual conclusion from his three years of tenure covering the Far East, during which he lived for some time in Japan. In a time in which orthodox opinion urges catching up to the economic success of Japan by emulating that country's management and production methods, Fallows says precisely the opposite — that the U.S. is better off when it behaves in a uniquely American fashion.



Unfortunately, while Fallows' work cannot be characterized as off-base, the book also falls well short of visionary. Fallows does show an observant bent, deftly illustrating the differences between the cultures of Japan and the U.S.

Those differences lie at the heart of his argument — that the disorder and lack of regimentation that characterize American affairs are precisely what makes its culture great, because of the opportunities for mobility and advancement that they create. He puts it bluntly enough: "If we have to out-cooperate and out-sacrifice the Japanese, we may as well quit." In a culture such as Japan's in which "everyone knows his place," he says, such an idea works.

But for Fallows, the idea of American culture is to have no place, no constraints that hold back ideas and opportunities.

However, in presenting a general, largely anecdotal case — much of which is based on his personal reminiscences — Fallows undermines his argument. There simply isn't enough meat on the bones: Readers are likely to be left with the lingering question, how do you juggle an unregimented strategy with the need for planning? The author's answer is a bit too glib: Better the chance to fail and suffer the consequences than to take no chance at all.

Without degrees

Fallows' argument is an enticing and critical one for the information systems industry, which is currently facing a time of retrenchment and consolidation. Information systems provides a couple of key examples that Fallows uses to buttress his argument.

He spends a good deal of the book arguing against the concept of a meritocracy, in which requirements for professional licensing — which, Fallows points out, are a fairly recent cultural development — have kept otherwise qualified people from contributing to such crucial areas as education and in which a college degree is paramount for white-collar acceptance.

Fallows sees this as a needless hardening of American arteries. For him, the ideal is a Microsoft that is too busy innovating to care whether its employees have college degrees. Similarly, he sees strength and flexibility in a culture in which Microsoft Chairman Bill Gates can be worth $1 billion and still be thought of a "basically a regular guy."

However, *More Like Us* does not really deal fully with the expectations of today's business world. It is easy to sit back and say, "Be adventurous," but harder to attempt adventurousness in an economy plagued by deficits and competition from all sides. Companies being forced to streamline are not likely to buy the idea that cultural mobility is the ultimate solution to their problems.

Fallows does address the need for more government support of business, partly to meet the efforts of Japan's powerful Ministry of International Trade and Industry, but his argument lacks pertinence in the current mood of U.S. government cutbacks.

Spending time in the Far East has lent Fallows some valuable insights, and they occasionally surface with the impact that they deserve. In addition, his service as a speechwriter to President Jimmy Carter affords him a seasoned view of government and America. However, *More Like Us* may be the rare book that could have used another 100 pages to make a slower, more thorough case. As it stands, it's not quite enough.

DONALD ST. JOHN

St. John is *Computerworld*'s assistant chief copy editor.

Computerworld is initiating a new series of reviews that will focus on business and management books. New books that fit into this arena should be sent to the attention of Glenn Rifkin, Book Review Editor, *Computerworld,* 375 Cochituate Rd., Framingham, Mass. 01701.

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Kawasaki

CONTINUED FROM PAGE 51

one dismissal, Shepard says: "There were some others we encouraged to leave — suggested, you could say."

Despite this blunt approach to the overstaffing — and the combat helmet perched atop his office hat rack — Shepard warns against creating an atmosphere of fear as a manager. "You get a few good people, treat them right personally and professionally, and you'll be amazed at how well things go," he says.

Asked if Shepard's view reflects management in Kawasaki's homeland, Peterson plays down the connection. "I think the Marines influenced him more than the Japanese," he says.

Financial management at Kawasaki does reflect the Japanese influence, Shepard says. "I have a fit once a year when I see my new budget. It's my actual spending for the current year," he says. "That's one thing that's very Japanese here: If you want anything budgetwise, figure out something you can make better or get rid of to pay for it."

It was within such constraints that Kawasaki created K-Share, its dealer network that serves as a sales-support tool, given that half of the dealers sell vehicles from other manufacturers. Dealers originally worked with terminals and were upgraded to Zenith Data Systems PCs in 1986.

Motorcycle dealers contacted rate systems from Kawasaki and Honda superior to others, with each offering some advantages that the other lacks. The Honda system is more elaborate, running on 20 floppy disks compared with K-Share's one. It also offers color graphics and fill-in fields compared with K-Share's monochrome display and DOS-style prompts. "Somebody stupid could probably order a part through Honda. With Kawasaki you've got to know some things," although an experienced user might find K-Share faster, says Whitney Blakesley, co-owner of Champion Kawasaki in Costa Mesa, Calif. Blakesley concedes that Honda's system will do more and is easier to use, but praises Kawasaki's IS people for being "more tuned in to what the dealers are doing."

This month Kawasaki is launching K-Pay, an Automated Clearing House interface that lets dealers make payments electronically, potentially cutting their interest expense and eliminating the keying of data on checks received at Kawasaki.

With their networked personal computers, Kawasaki salespeople can communicate with one another and the home office and make inquiries about customers' orders, payments and inventory.

Kawasaki has been able to deploy such systems with its reduced work force thanks in part to low turnover and productivity software such as fourth-generation language and software for job scheduling and report distribution, says Gary Bramwell, the director of data center services and one of the IS staffers who worked under Shepard's predecessor. Low turnover builds up a force of experienced employees and reduces the need for training, Bramwell says.

Attention to price and performance in making purchases helps keep the budget growth down, he adds. "We get price quotes from at least three people on everything we install," he says.

When the IS group grew to 95 employees, it tried to do too much at once, according to Bramwell. "Management had undertaken too many aggressive projects. They were going to miss deadlines and started throwing people at them," he says. "People were not managed very well, and their productivity was low."

> "I HAVE A FIT once a year when I see my new budget. It's my actual spending for the current year. That's one thing that's very Japanese here: If you want anything budgetwise, figure out something you can make better or get rid of to pay for it."
>
> ROBERT O. SHEPARD
> KAWASAKI MOTORS

With the completion of major transaction-oriented systems, Kawasaki's IS group intends to focus on decision-support technologies.

"When we get finished cleaning up our act and go into maintenance mode, we should be able to tap into decision-support tools," Peterson says. "Otherwise," Shepard adds, "you're building pieces of a decision-support system and tearing it down as the infrastructure changes."

The decision-support technologies — graphical user interfaces, SQL and a relational database, among others — will be aimed in part at reducing the need for skilled IS professionals to cull reports on a request basis. They may make the transaction-oriented system look slicker but at a substantial cost and with little business payoff, Peterson says.

What happens when the decision-support architecture is in place? "The problem is your business is changing all the time," Shepard says. "The key is that — busy as you are — you have to keep an eye on what is changing with information technology and business and look ahead, so you always have your vision of the future, so you're not working on things that would be outdated two years from now."

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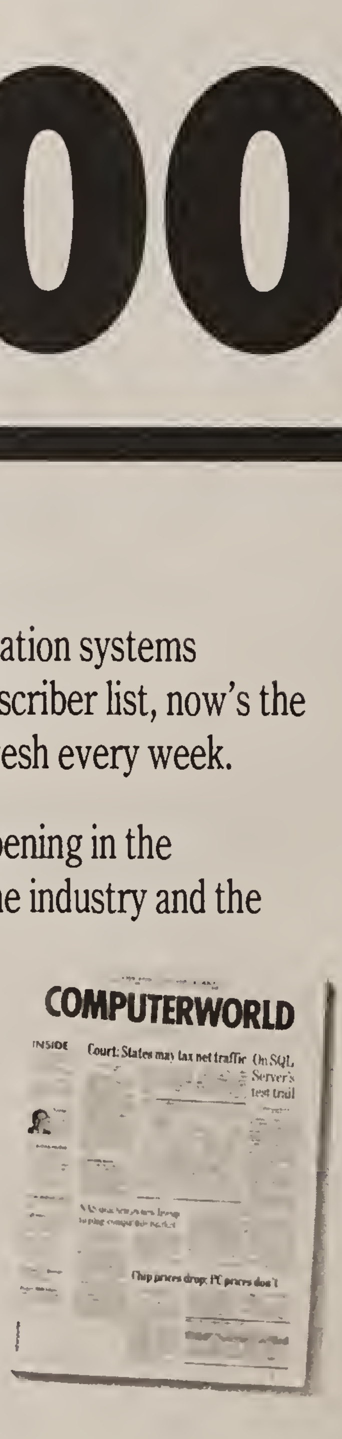

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*Audit Bureau of Circulations Supplemental Data Report, May 25, 1987

TAKING CHARGE

Ellis Booker

Get real with artificial intelligence

The nation's first artificial intelligence laboratory for educational and training technologies, the Institute for the Learning Sciences, was established earlier this summer by Northwestern University and high-technology consulting giant Andersen Consulting. They will jointly fund the lab, which will be located a few blocks from the university's Evanston, Ill., main campus.

But the setting for the announcement breakfast at the University Club in Chicago's downtown Loop area was unwittingly and terribly ironic. This city's public schools are widely believed to be some of the nation's worst, and like so many other urban school systems, Chicago's counts an appallingly high number of dropouts.

So, while representatives from Andersen and the university spoke excitedly about the potential of the institute's wide-ranging, cross-disciplinary approach — it will encompass the fields of computer science, psychology and education — one was tempted to ask, will any of this help schoolchildren? Will the lab, which hopes to attract nearly 100 topflight researchers and students, help hard-pressed U.S. schools?

Certainly the lab's first director, noted AI researcher Roger C. Schank, hopes to take the institute's basic research and apply it to educational problems in general.

"We can build software to teach an 18-year-old service representative to read a manual," says Schank, formerly the head of Yale University's Artificial Intelligence Project. "We can design programs on another scale to teach fourth graders to read."

An enthusiastic man with the style of a natural-born teacher, Schank sees his lab as an opportunity to "reexamine what should be taught and how to teach it." He blasts current educational software, which he says is either written by programmers ("shoot down at the verb as it flies by") who know nothing about teaching or children, teachers who know nothing about computers or educational publishers who should know better but refuse to make the investment.

The best computerized teaching tool to date, Schank contends, is the flight simulator. Used by the military and commercial airlines to train pilots, this type of system creates an uncanny simulation of flying a jet airplane and encourages learning based on need.

Simulations, Schank says, could be used for other kinds of learning. For example, he describes a "chimpanzee simulation" that one of his Yale graduate students — who has followed Schank to Northwestern — is building. Students learn about chimpanzees as they interact with the simulation.

"People are interested in things when they are interested in them," says Schank, who thinks this self-evident idea is woefully lacking in modern educational practices.

Computer-aided curiosity

Similarly, instead of learning from books in the traditional, linear fashion, students on multimedia computer systems — what Schank, for lack of a better phrase, calls "discovery learning stations" — will be prompted to follow their curiosity, controlling the program and images through a natural-language interface. As it happens, the lab will use Apple's Macintosh II as its learning station platform.

Finally, Schank vows that the technologies developed at the lab will go toward Northwestern's School of Education, where he will be a professor.

Still, a thoughtful student will see that Schank's lab, which Andersen is backing with $15 million during the next five years, is an alliance between an institution of higher education and a for-profit business.

As such, it should come as no shock that Andersen wants to use the lab's software for training its own employees and, eventually, the employees of its clients. Andersen, which says it now spends $100 million a year on training its employees, will retain right of first refusal on the license of any technologies developed at the institute that are not directly funded by another company or government agency. Other commercial backers of the institute are expected, according to Northwestern, which itself will fund the lab at around $2 million a year.

Clearly, American business also faces an education crisis. The skilled work force is shrinking, and changing economic realities may, according to some, require new employees to change their jobs three to five times during a career. Meanwhile, the society's "knowledge base" is increasing 1% per year, observers say.

For me, this commercial aspect of the institute is not suspect. It is, however, sad. Sad because government has yet to commit itself — even under "Education President" Bush — to the sort of innovative, even provocative, educational technologies that Northwestern's AI lab will explore. Sad because employees at a few Fortune 500 firms will likely be the first beneficiaries of the institute's tools, not the schoolchildren who desperately need them.

Booker is *Computerworld's* Chicago correspondent.

MIT's Lester hits U.S. manufacturing flaws

BY JEAN S. BOZMAN
CW STAFF

NAPA, Calif. — Despite the introduction of computer-integrated manufacturing (CIM), the U.S. manufacturing scene remains troubled by short-range planning and poor management of human resources, according to Richard Lester, executive director of the MIT Commission on Industrial Productivity.

Lester spent more than a year coordinating 550 interviews with workers, managers and executives at 150 manufacturing plants in the U.S., Europe and Japan. The commission's findings, now published in the book *Made in America*, concluded that the U.S. could be doing more to remain a world-class competitor.

"There's a top-down approach," Lester told Hewlett-Packard Co.'s annual CIM-inar here last month. "We're treating the economy like a black box and twiddling with the knobs." The results, he said, are high interest rates, international trade imbalances and budget deficits.

Pessimistic prognosis

The MIT project, in which eight study teams were deployed around the world, came back with a bad report on the U.S. "We saw deep-rooted, systematic weaknesses that were preventing many U.S. firms from adopting the best practices that would allow them to be more competitive," he said.

Lester outlined an action plan to highlight what he believes are the top priorities in the new economy. First, U.S. firms must forego their tendency to adopt short-term horizons. "Higher interest rates force companies to take a shorter term view," Lester said. Currently, many U.S. companies, including those in the computer industry, are holding the line on research and development costs to boost profit margins. However, long-term R&D investments often pay off with new and unexpected products, Lester noted.

Learn = earn

The greatest danger, he said, is "the profligate waste of human resources, which is caused by the sorry state of U.S. public schools." The factory cannot be made more productive through CIM without investing heavily in its workers. "We've managed to overcome the poor schooling problem by importing foreign students and keeping them after they graduate," Lester said.

However, it is the lower half of the work force, the semiskilled workers, who must be reached if yearly U.S. productivity gains are to break past the level of 1% to 3%, Lester said.

"Some companies regard human resources as a cost to control, rather than as an asset to be managed," he said, noting that an organization's performance is only as good as that of the less qualified half of its work force allows it to be.

CALENDAR

Unattended operations — the "lights-out" data center concept — continues to generate a lot of interest. But is anyone really achieving true lights-out? The Association for Computer Operations Management (AFCOM) aims to find out at its educational symposium, "Lights On About Automated Operations," next month.

The symposium, to be held Sept. 11-12 in Kansas City, Mo., will include sessions on case studies, monitoring the data center, productivity through tape robotics, VSE automation, multivendor environments, achieving direct-access storage device management success and more. For more information, contact AFCOM at 742 E. Chapman Ave., Orange, Calif. 92666.

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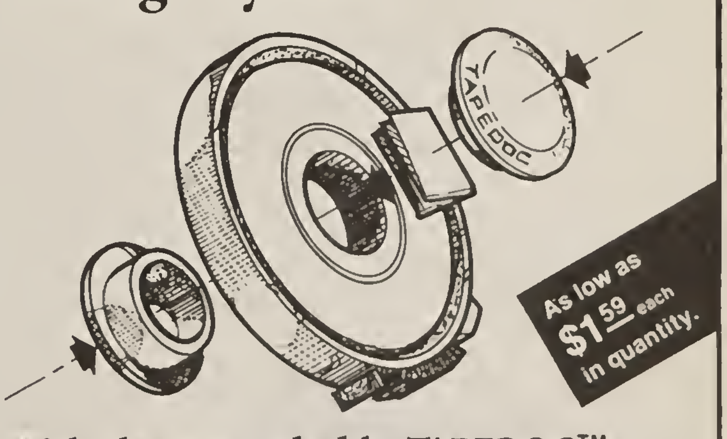

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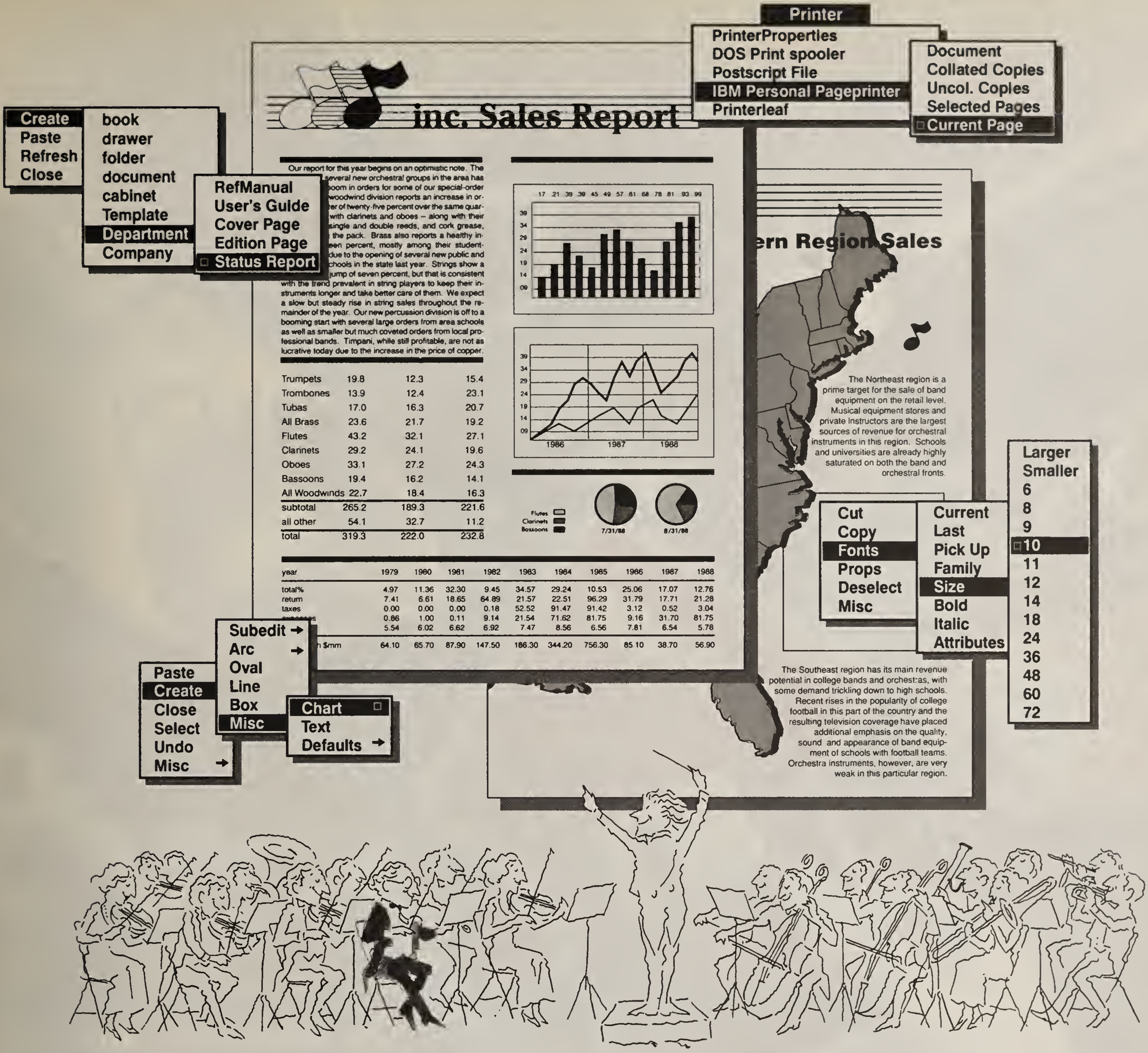

Our report for this year begins on an optimistic note. The
several new orchestral groups in the area has
boom in orders for some of our special-order
woodwind division reports an increase in or-
er of twenty-five percent over the same quar-
with clarinets and oboes – along with their
single and double reeds, and cork grease,
the pack. Brass also reports a healthy in-
een percent, mostly among their student-
due to the opening of several new public and
chools in the state last year. Strings show a
jump of seven percent, but that is consistent
with the trend prevalent in string players to keep their instruments longer and take better care of them. We expect a slow but steady rise in string sales throughout the remainder of the year. Our new percussion division is off to a booming start with several large orders from area schools as well as smaller but much coveted orders from local professional bands. Timpani, while still profitable, are not as lucrative today due to the increase in the price of copper.

Trumpets	19.8	12.3	15.4
Trombones	13.9	12.4	23.1
Tubas	17.0	16.3	20.7
All Brass	23.6	21.7	19.2
Flutes	43.2	32.1	27.1
Clarinets	29.2	24.1	19.6
Oboes	33.1	27.2	24.3
Bassoons	19.4	16.2	14.1
All Woodwinds	22.7	18.4	16.3
subtotal	265.2	189.3	221.6
all other	54.1	32.7	11.2
total	319.3	222.0	232.8

year	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
total%	4.97	11.36	32.30	9.45	34.57	29.24	10.53	25.06	17.07	12.76
return	7.41	6.61	18.65	64.89	21.57	22.51	96.29	31.79	17.71	21.28
taxes	0.00	0.00	0.00	0.18	52.52	91.47	91.42	3.12	0.52	3.04
[illegible]	0.86	1.00	0.11	9.14	21.54	71.62	81.75	9.16	31.70	81.75
	5.54	6.02	6.62	6.92	7.47	8.56	6.56	7.81	6.54	5.78
h $mm	64.10	65.70	87.90	147.50	186.30	344.20	756.30	85.10	38.70	56.90

The Northeast region is a prime target for the sale of band equipment on the retail level. Musical equipment stores and private Instructors are the largest sources of revenue for orchestral instruments in this region. Schools and universities are already highly saturated on both the band and orchestral fronts.

The Southeast region has its main revenue potential in college bands and orchestras, with some demand trickling down to high schools. Recent rises in the popularity of college football in this part of the country and the resulting television coverage have placed additional emphasis on the quality, sound and appearance of band equipment of schools with football teams. Orchestra instruments, however, are very weak in this particular region.

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PRODUCT SPOTLIGHT

THE MACINTOSH MARKET

Establishing ties with foreign markets

SCOTT BALDWIN

BY JIM BRUNET

Improved local-area network options and a wave of new products designed to permit connectivity with Digital Equipment Corp. VAX and IBM mainframe environments are creating broader opportunities for Apple Computer, Inc.'s Macintosh personal computers in the corporate computing arena.

Not all Apple watchers are as enthusiastic as David Ryter, vice-president of Pacer Software, Inc., a vendor of Mac-to-VAX server software, who maintains, "The development of connectivity solutions in LAN, VAX and IBM mainframe environments has dispelled the Macintosh's image as a toy or a risk in the corporate environment." Most will agree, however, that Mac connectivity solutions have added to the machine's credibility among corporate users.

Apple's connectivity strategy embraces three main goals: developing Appletalk for Macintosh networks; integrating the Mac with target environments, such as DEC and IBM machines and protocols, Open Systems Interconnect (OSI) and Transmission Control Protocol/Internet Protocol; and offering users and developers common tools.

In the LAN arena, one of Apple's most important recent developments is the introduction of Appletalk Phase 2. Phase 2 provides users with features critical to the operation of large networks, such as addressing, routing and broadcasting.

The new features theoretically expand Appletalk's addressing capabilities from 254 to 16 million nodes. The routing and broadcasting features improve efficiency on multiprotocol networks — for example, LANs containing a mix of Mac, DOS and OS/2 systems. One key feature is the ability to address logical network segments, such as the accounting or marketing department, as opposed to physical network segments.

Apple's other significant LAN-oriented announcement is support of IBM's Token-Ring. Apple's Tokentalk product allows Macs to be added to existing PC networks connected by Token-Ring without affecting the PC network.

Dave Marshak, an analyst at Patricia Seybold's Office Computing Group in Boston, says he believes networked Macs are now entering a more mature phase.

"Previously, Macs have been connected rather haphazardly — three Macs and a Laserwriter constituted a network," Marshak says. "Now, a formal architectural approach, using tools such as the X Windows windowing system, CL/1 [an SQL-based network applications language developed by Network Innovations Corp.] and the communications tools in Apple's [soon to be released] System 7.0 operating system, will allow powerful extended networks to be created."

But while Mac LAN connectivity is still evolving, the new heavy action is in Mac-to-host

INSIDE

Depositing the Savings

Choosing a hard disk (see chart, page 66) is simple, compared with picking a backup medium. Page 64.

Tried It, Liked It

Developers have started taking the Mac seriously as a platform for new AI products. Page 65.

Brunet is a free-lance writer based in Los Angeles.

Ties

FROM PAGE 61

connectivity. Mac-to-VAX connectivity is the most advanced. The basic connectivity problems — making physical and data link connections and establishing rudimentary terminal emulation capabilities — have been solved.

"There are many VAX terminal emulation products, plus a full array of file servers, Ethernet interfaces, routers and gateway bridges and Mac-to-mainframe database access programs," says Dave Kosiur, editor of Fullerton, Calif.-based "Connections," a Mac connectivity newsletter.

Co-op development

Much of the impetus for this array of products comes in part from the joint Apple/DEC development program announced in August 1988. "The Apple/Digital program provided the framework for Mac-to-VAX connectivity; it is essentially a cooperative development agreement with mutual support," says Lyle Anderson, director of emerging technologies at DMR Group, a New York-based international consulting firm.

A Mac can be connected to a VAX in one of two ways: either the VAX appears to the Mac as a node on an Appletalk network, or the Mac appears to the VAX as a Decnet node.

Of the four VAX file-server products currently available, Alisa Systems, Inc.'s Alisashare and Pacer Software's Pacershare are by far the predominant ones. These products provide VAX file-server capabilities to Macs connected to VAXs either directly by Ethernet or via Appletalk networks connected to Ethernet by a bridge.

The major question in using the VAX as a file server is how to use it. "When using VAX as file server, everyone wants to drag 40M bytes of hard disk [data from the] Mac to the VAX. Much of this [data] is redundant, such as systems folders and bitmapped fonts," points out Robert Denny, Alisa Systems' president.

Another problem, Denny says, is that VAXs typically take one-quarter of a second to create a file, creating a prohibitive load when transferring a disk containing thousands of files. He suggests a better way to use file servers is to put shared or infrequently used utilities, such as spelling checkers or type fonts, on the VAX.

Both vendors and users note that although print servers may not have the glamour of file servers, both are heavily used at most customer sites.

"Sharing the high-capacity laser printer is the single biggest use we have for our network," explains Jay Thomas, research engineer at the Imaging Systems Division of Du Pont Co. in Brevard, N.C.

Currently available connectivity solutions that make a Mac appear as a Decnet node include Technology Concepts, Inc.'s Community, Alisa Systems' TSSnet and Dove Computer Corp.'s Fastnet. This approach is favored in computing environments that are heavily tied to DEC-centered processing.

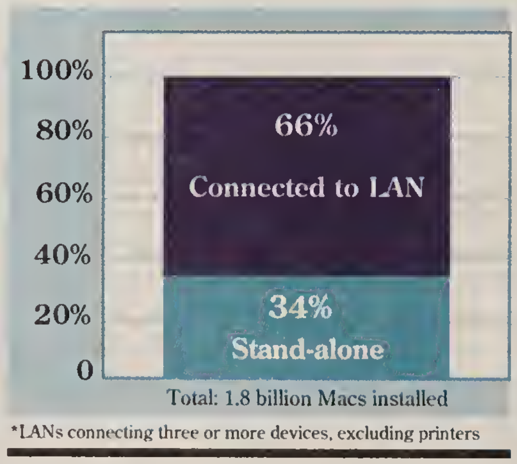
To further these basic connectivity capabilities, DEC added its Local-Area Transport (LAT) protocol to the joint development agreement in May. This protocol will provide Macs with a terminal session capability, enabling multisession VT terminal emulation over Ethernet to multiple VAX hosts.

But the main focus of Mac-to-VAX connectivity these days is on developing applications that take advantage of the connections. To this end, as part of their joint development agreement, Apple and DEC announced a set of Application Programming Interfaces (API) that provide software developers with a standardized framework for developing end-user applications such as database server programs.

Included in the set are APIs for both SQL and CL/1, which provide the host database access necessary to construct database servers. Connectivity languages such as CL/1 can write applications without host or network code to access mainframe data.

Global connections

*By the end of 1988, two-thirds of the worldwide installed base of Macintoshes were connected in some form to a LAN**



*LANs connecting three or more devices, excluding printers

SOURCE: DATAQUEST, INC. CW CHART: DOREEN DAHLE

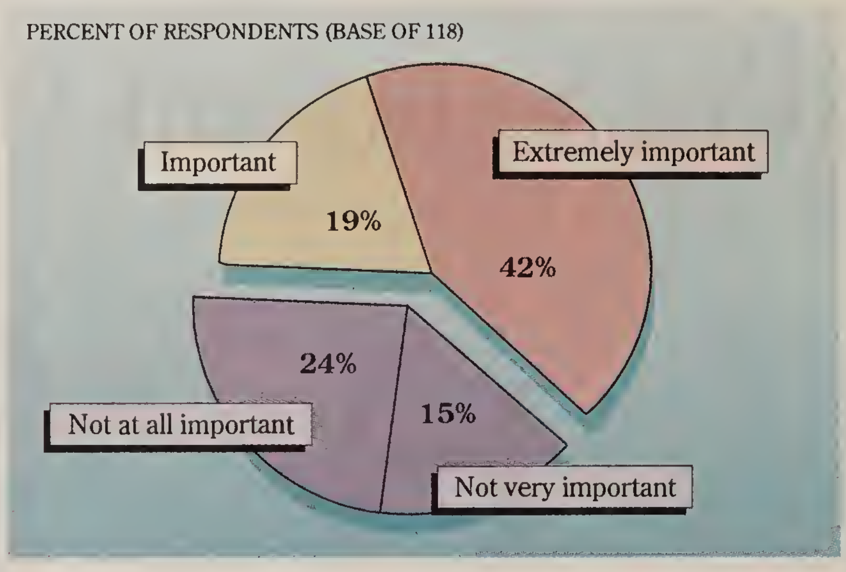
"Between Digital and Apple, we're providing the glue and plumbing, built around industry standards, to form useful networks, independent of hardware," explains John Rose, manager of DEC's Personal Computing Systems Group.

DMR's Anderson says that CL/1 has great potential as a language because of its ability to support distributed applications running across a network and because of the number of third-party vendors that support it.

"Everyone who has a database or spreadsheet for the Mac — at least a dozen vendors — is engaged in CL/1 development," Kosiur says. There are, he adds, at least another half-dozen without any previous database background developing CL/1-specific applications. Some of the names involved in demonstrations of CL/1 applications at Dexpo East '89 in February were Odesta Corp., Neuron Data, Inc., Tactics International, Andyne Computing Ltd. and Fairfield Software.

Aiming for the mainstream

More than half of the executives surveyed felt that the ability to network Macs into the corporate computing environment was important



SOURCE: A 1988 *COMPUTERWORLD* EDITORIAL ADVISORY BOARD SURVEY CW CHART: DOREEN DAHLE

Macintosh connectivity applications are more evolved in the VAX marketplace than in computing environments that include IBM mainframes. Anderson says prospects for products offering Mac-to-IBM connection are good but notes that the state of the art here is 12 to 24 months behind the VAX arena.

The current offerings of Mac-to-IBM connectivity products are basic physical- and data link-level connections and simple terminal emulation.

"The IBM market is still in its infancy. Emulation cards come first, then peer-to-peer applications — as with the LU6.2 protocol," notes Joyce Enos, product manager for Avatar Corp.'s Macmainframe, one of the half-dozen Mac IBM 3270 emulators on the market.

> "BETWEEN DIGITAL and Apple, we're providing the glue and plumbing, built around industry standards, to form useful networks, independent of hardware."
>
> JOHN ROSE
> DEC

Besides a few terminal emulators, Anderson says, the only Mac-to-IBM mainframe product that is shipping is the Oracle Corp. database server. "It's the only product in this niche that provides both server and requestor software [for each side of the mainframe/Mac sides of the network connection, respectively]," he says. "It also provides distributed data management to keep data synchronized on both sides of the network."

Some observers are quick to point out the advantages of a Mac-to-IBM connection. One tremendous advantage that the Mac offers is its ability to copy and paste data from the mainframe into local applications, an important feature not built into any other micro used as a terminal, according to Anderson.

"Another benefit is the ability to upgrade the user interface [via the Mac] to your mainframe applications without having to upgrade your applications portfolio," he adds. "Mac-to-mainframe combines the user-friendliness of the Mac with the power of the mainframe."

Others, however, question whether Macs will be as successful connecting to IBM mainframes as they have been connecting to VAXs. They point out that DEC did not have a viable presence on the desktop. Furthermore, DEC customers, by definition, lacked any predisposition to buy products from IBM.

Unlike the VAX marketplace, in which the Mac enjoys VAX users' positive reception and DEC's active support, in IBM-dominated shops Apple is often faced with a skeptical audience, with IBM itself in a position to wage a tenacious, punishing battle for control of the desktops.

Still, the potential payoff for Apple from successful penetration into IBM accounts is much too large to ignore. "Forty to fifty percent of all corporate networking is SNA," points out Alec Carlson, architect of Technology Concepts' Community. "And IBM ultimately plans to replace 3270 with Token-Ring, which represents a huge market for Apple to connect to either Token-Ring workstations or departmental computers."

"The objections from MIS have been a lack of connectivity. 3270 and Token-Ring should help," says Bill Stewart, product manager for Mac 3270 from Simware, Inc. Simware's emulator provides script language to go with 3270 emulation to automate such procedures as logon and file transfers.

Apple has moved quickly to capitalize on that opportunity. According to Henri Aebischar, Apple's director of product marketing for networking communications products, the company's Mac Advanced Program-to-Program Communications product is the first certified non-IBM version of the LU6.2 protocol. It implements 3270 coaxial, Token-Ring and Synchronous Data Link Control (SDLC) serial connections to mainframes and serves as the basis for Apple and third-party Mac-to-IBM-mainframe products.

Promises to keep

Possibly the most promising of Apple's recent announcements are the System 7.0 systems software and the communications toolbox for the Macintosh, which many believe will significantly affect Mac connectivity in the corporate environment. The System 7.0 announcement could clear up many of the objections the Macintosh has faced in this environment, particularly in those shops where IBM mainframes dominate.

"The June announcements lent credibility, showing that Macs are real business machines, support SAA and won't bring down your systems," Enos points out.

According to Carlson, System 7.0 will set communications standards that would force consistency on communications products, just as the Mac user interface provided windowing standards for all applications.

"The interprocess communications of System 7.0 [may] make it easier to exchange data within a work group," Kosiur adds. "You can mix and match applications that share data as you like, not according to what combinations some software developer thought were important."

One major question remains as a result of the System 7.0 announcement and Apple's other connectivity initiatives. With Apple providing services such as bridges and routers, what is left for the third parties?

Traditionally, the company has relied on third-party vendors to provide much of the actual end-user networking products and to act as a testing ground for potential products. Now, however, many of the independents are facing the prospect of competition from Apple itself.

Co-opting ground that has been broken by others is not a new tactic. "Apple looks for third-party vendors to pioneer a technology and prove its worth, then they enter the market," Kosiur says.

Watch your step

Noting that something similar happened to White Pines Software, Inc., which "spent a lot of time putting X [Windows] on the Mac" only to have Apple step in with Mac X, Carlson says that is is always advisable for third-party vendors to remain wary when dealing with Apple.

"Vendors must be cautious," he advises. "They must guess where Apple is heading. No one wants to put 12 to 18 months of development in, only to see Apple come up with the same product."

Although Apple's stepped-up involvement introduces new risks for third-party connectivity vendors, some observers contend that the company is moving carefully, trying to advance its interests in the corporate market without shutting out third parties.

Anderson, for example, doubts that third-party LAN vendors have reason to worry about Apple's moves. "Apple provides connectivity at the physical level [of the OSI model] but hasn't dealt with the applications layer, such as file transfer or print services," he explains.

On the whole, he says, System 7.0 should be a boon to software developers. "It [reportedly] deals with a lot of the Mac's limitations and is generally on the same level of real-world abilities as OS/2, except for multitasking. The toolbox isolates developers from the details of the communications environment; they don't have to know whether a connection will be bisynch, asynch or SDLC."

> "VENDORS MUST BE cautious. No one wants to put 12 to 18 months of development in, only to see Apple come up with the same product."
>
> ALEC CARLSON
> TECHNOLOGY CONCEPTS

The going may be hard for some third-party vendors whose products are now facing direct competition from Apple, but some feel that there is opportunity for development of unique selling advantages. And some of these enhancements could be what is needed to entice larger portions of the corporate market, which is currently more concerned with connectivity at the applications level than with pure connection.

According to Pacer Software's Ryter, "The Apple addition of connectivity 'plumbing' to the basic Macintosh is pushing third-party connectivity vendors toward value-added services such as E-mail."

Furthermore, by taking more of the connectivity upon itself, Apple may be opening the door for new third-party contributions.

Many analysts see ground-breaking possibilities in the budding crop of client-server products that permit distributed and cooperative processing. Kosiur, for example, sees the future of connectivity in products like Odesta's Helix VMS, which will run "the application of your choice locally while accessing mainframe data on a networked host machine."

"Cooperative applications," Anderson says, "where part of the application, such as a database server, sits on the mainframe and a front end sits on a networked workstation, are in the mainstream, not just for Apple, but the whole [computer] industry." •

ASK THE VENDOR

We use several Shiva V2400 Netmodem modems to connect our Macintoshes to an Appleshare network. Because of the increasing number of users on the network, we are now wondering if it is possible to hook up several phone lines per modem. Also, does Shiva have any plans to release a 9.6K bit/sec. modem that will definitely handle multiple phone lines?

Jeff Glick
U.S. News and World Report
Washington, D.C.

SHIVA CORP.: We have no plans to introduce a Netmodem that supports more than one phone line. Since each line would need a separate set of modem electrons, there is little cost savings to be gained by supporting multiple lines per unit. However, the Netmodem is designed so that you can put as many users on the network as you need to, up to Appletalk's normal limit.

We are waiting for a 9.6K bit/sec. modem standard to emerge before building a Netmodem 9600. In the meantime, if you want to share a 9.6K bit/sec. modem on your network, you can use our Telebridge.

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Baffled by backup?

BY ASHLEY GRAYSON and ERIC BALDWIN

Choosing the right hard disk for the Macintosh is a straightforward task, based on speed, volume and price. Choosing the right device to back up that hard disk is another matter, however. Not only are a variety of technologies available to back up the Macintosh, but a number of procedural questions need to be answered when making a backup choice.

Several different types of backup technology are available: floppies; tape; and removable, hard or optical media.

For Macintosh users with 20M-byte hard drives, backing up to floppy disks is a viable option. There are a dozen different software packages that provide users with file-by-file cataloging and incremental backup. These products can be purchased for less than $200; if used regularly, they provide efficient and reliable backup for lower capacity hard disks.

For larger hard disks, tape backups are generally preferred for their speed, security and high capacity. The same DC2000 low-density-format and DC600 high-density-format cartridges that have become the standard ¼-in. tape formats in the DOS world form the backbone of most Mac tape units. A typical DC2000-based tape backup system for the Mac will hold 40M to 80M bytes at a rate of around 512K byte/min. DC600-based tape systems can hold up to 150M bytes at a rate of around 1M byte/min.

Several manufacturers offer tape backup systems for the Macintosh. Basic systems with 20M-byte capacity and mirror-image backup begin at $500. Higher capacity systems with more sophisticated software can cost $2,000 or more.

Unfortunately, while there are standards for ¼-in. tape on the DOS side, no similar standardization of tape formats exists for the Macintosh. Every tape drive manufacturer has its own unique format and software, so a backup made with one will not restore on any other.

For the individual user, this presents few problems. For the network manager, however, this means that any backup strategy relying on a tape drive must be supported by a second identical tape drive or be in constant danger of suffering a single-point failure.

Compatibility questions arise with removable disk cartridges as well, although there are fewer formats to contend with. Removable disk cartridges fall into three categories: high-capacity floppy disk drives, hard cartridges and removable hard-disk packs.

> EVERY TAPE drive manufacturer has its own unique format and software, so a backup made with one will not restore on any other.

High-capacity floppy disk drives use 5¼-in. flexible media encased in plastic cartridges that look like oversized Macintosh floppies. While their performance specifications are similar — 20M-byte capacity per disk, or about twice as fast as the Mac's own 800K drive — all of their formats are different and incompatible.

Prices for these drives range from $1,000 to $2,000, and disks cost from $50 to $125 each, which makes high-capacity floppy drives more expensive than tape if used as a dedicated backup system. These drives can be used as auxiliary hard disks at a low cost per megabyte.

Hard cartridges use the same metal disks as fixed hard drives but are encased

---

Grayson and Baldwin are founder and senior project manager, respectively, of ADG in San Pedro, Calif.

ASK THE VENDOR

What kind of features does CMS Enhancements' Ultrapower 4.5 have that will deal with problems arising in the event of a power outage? Is it equipped with a uniform shutdown?

Kevin Kelly
Computerland
Seattle

CMS ENHANCEMENTS, INC.: We offer a series of on-line, uninterruptible power supplies (UPS) for use with small-footprint computers. These UPSs supply clean, conditioned power sufficient to support CPUs, monitors and other peripherals during brownouts or main power supply failures, enabling users to power down their computer without losing files. Ultrapower 4.5 offers emergency keyboard lights, remote-on and protection against power disturbances including extended brownout protection down to 95 volts AC. At full power, the battery will last 22½ minutes in the event of an outage; it is equipped with uniform shutdown.

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in a plastic cartridge. Their seek times compare with midrange fixed disks using formatted capacities of around 40M bytes.

Hard-cartridge drives offer relative compatibility between brands, because most of them are actually manufactured by the same company. The six or seven different brand-name drives all are priced about $1,500, with media costing $125 to $200. Like the high-capacity floppy drives, hard-cartridge drives can double as backup systems and auxiliary hard disks.

Removable hard-disk packs are fairly new, with only a few currently on the market. These are hard disk drive units that are divided into two parts: the power supply/controller module and a sealed disk pack with its own read/write head.

Hard-disk packs offer the greatest capacity of the different types of removable cartridges — up to 120M bytes. They are also more expensive. Prices start at $2,500, and each additional hard-disk pack costs between $1,500 and $2,000.

The advantages of hard-disk packs are that these are true hard-disk systems that can operate as both primary and backup systems. Again, there is no compatibility among manufacturers.

The main advantage of backing up one hard disk to another is that if the original fails, the backup can be brought on-line immediately. One drawback is that it erases the previous copy. A successful backup scheme requires more generations to create the protection of an audit trail. Another problem is that devices that use the technology of the device they back up are prey to that technology's weaknesses.

Optical storage encompasses compact disk/read-only memory (CD-ROM) drives, write-once read-many (WORM) drives and erasable optical drives. Of these, only erasable optical drives, which are not yet available commerically, offer the potential for everyday backup.

The CD-ROM drives, of course, cannot be written to. WORM drives let you write only once, making them good for archival backup but not for the kind of revolving generational backups most users need. No one currently buys optical technology as a dedicated backup system, but it is possible to use it for both backup and mass storage.

Biggest value

Although optical storage devices are expensive — up to $6,000 per single disk unit — its per-megabyte cost is only around $250 per 600M-byte disk, lower than any other media.

Only one or two erasable optical drives are available for the Macintosh at this time, and no specific backup software has been written for them. Backing up to these devices must be done through the Mac's Finder operating system file manager and therefore is limited to a disk-copy mirror-image backup or a supervised file-by-file backup.

Optical disk backup has yet to come of age, but high capacity and low cost per megabyte may eventually make it attractive for hard-disk backup in the 300M-byte and higher range, as well as for network backup.

The choice of backup devices should be based on a realistic examination of needs. Virtually any backup system will do, as long as it is meant to be used only for one self-contained system. Budgetary and security issues also need to be considered. However, the best backup device is one you will use regularly, regardless of format, media or mechanism. •

Food for thought

Users will find that procedural issues often dictate hardware choices when backing up a Macintosh hard disk. These issues can include the following:

- Do you back up only data files, or do you also back up the profile of the Macintosh? Backing up only data requires less storage capacity but more sophisticated software to extract the appropriate files from the hard disk to be backed up. Backing up the profile — every file needed to recreate the working software environment of the Macintosh — requires a mirror-image backup and demands that the backup media have the same or greater capacity as the original hard disk.
- How many backup generations are you going to maintain? For backup systems with nonremovable media, data storage capacity is the issue. For removable media systems, capacity issues are less important than the ability of the software to catalog sequential backups.
- How often do you intend to perform a backup procedure? The more frequently you perform a backup, the more consideration the speed of the backup device must be given.
- How large is your hard disk? Removable media makes it possible for low-capacity backup systems to back up high-capacity hard disks, but as the number of disks or tapes required increases, so does the potential for error.

ASHLEY GRAYSON and ERIC BALDWIN

Developers wise up in AI tool market

BY DAN SHAFER

The Macintosh is turning out to be the sleeper of the artificial intelligence market. Two years ago the Mac was all but ignored by most developers of AI tools; today, however, it is viewed by both tool vendors and serious users of AI technology as a viable, important platform.

Few AI products now confine themselves to the DOS world; almost all of the successful tools of recent vintage are available on both the Mac and DOS machines. Those vendors whose products do not run on the Mac are planning or developing versions that take advantage of Macintosh features such as its graphical interface.

The expert-system shell market is one area in which the Mac is thriving. More than a dozen tools, ranging in price from under $100 to $6,000, have become available in the last year, bringing the total available up to 20.

> TWO YEARS AGO the Mac was all but ignored by most developers of AI tools; today, however, it is viewed by both tool vendors and serious users of AI technology as a viable, important platform.

Some of these shells are Macintosh versions of existing DOS products. Until recently, Neuron Data, Inc.'s Nexpert-Object was the only high-end product available for the Mac. This product, priced around $6,000, features superb interoperability, enabling it to integrate with other programs on the system. A little competition never hurt any product, however, and Nexpert-Object, while still easily the leading product in the over-$1,000 category, is starting to get some.

Goldworks II, from industry leader Gold Hill Computers, Inc., is the latest arrival on the high end. Goldworks II promises to give Nexpert-Object a serious run for the high-ticket buyer. Its biggest drawback is the fact that it is based on LISP, which means that its interoperability is minimal; also, programmers who can code in its underlying language are few and far between and are high-priced themselves.

Neuron Data, by contrast, recently announced a Hypercard bridge capability, which allows tight integration of Hypercard applications and the Nexpert-Object inference engine.

One product that could easily have an impact on this segment of the market is VP-Expert Macintosh, an unannounced but widely rumored version of Paperback Software International's very successful DOS-based tool platform. It is easy to use, produces efficient expert systems and creates interactive graphics as easily as tools costing many times its $250 price tag. The Mac version is said to sport all of the features of the DOS product along with some new ones; the release date is rumored to be in November.

Just for the Mac

Interestingly enough, there are now a few expert-system shells running solely on the Macintosh, where they can take advantage of Apple's Hypercard software and the Mac's unique capabilities. These products include Hyperpress Publishing Corp.'s Intelligent Developer, Human Intellect Systems' Instant-Expert Plus and Peridom, Inc.'s Cognate.

Intelligent Developer is a strong middle-ground entrant in the expert-system shell market priced below $400. It offers free runtimes and delivers finished expert systems as stand-alone applications capable of running even on the Macintosh 512K or as Hypercard stacks, which require the now-minimum standard 1M byte of memory.

Combined with Intelligent Developer, Hyperpress' recently introduced Big Time TV full-motion video product allows expert-system builders to incorporate television-style images and motion into their expert systems. That means, for example, that instead of merely telling the user how to fix a problem on a car, the expert system can call up a video sequence from a laser disk and show the user the process. The user can even stop or reverse the video or put it in slow motion as he follows the instructions.

Millennium Software's Hyper X, a simple stand-alone shell product entirely in Hypercard, lets you build, test and deliver expert systems without leaving Hypercard. Many users feel Hyper X, which is priced at less than $100, is the best way to learn about the technology before deciding which shell to use to create and deliver finished applications.

Expert-system shells are only the latest addition to the Mac AI arsenal. LISP and Prolog, the two dominant AI programming languages, both have respectable representation on the Macintosh, although no significant new development has occurred in the past year or so.

Arguably the best of the five Mac versions of Prolog currently available is from Advanced AI Systems, Inc., which has one of the longest track records on the Mac and is favored by a number of developers for AI prototyping and development. Priced at less than $300, this is a robust implementation of the language.

Among the half-dozen versions of LISP available for the Mac, two vie for top honors. Expertelligence's Procyon Common LISP is getting a lot of developers' attention these days because of its interface and full implementation of the Common LISP standard. Allegro Common LISP, originally published by Coral Software Corp. but recently acquired — along with the company — by Apple itself, is a full-bodied LISP favored by developers concerned with speed and simplicity of interface.

Both of these products are robust and usable versions of LISP, a language that dominates AI in the research world but is falling into disuse as a delivery vehicle because of its difficult-to-access approach to outside language environments.

The latest attention-grabbing technology is neural networks. Essentially, neural nets are hardware and/or software products designed to recognize patterns in data so that they can make decisions when other data patterns are presented. Fewer than a half-dozen serious Macintosh products are available — equaling about one-quarter of the current DOS market — and none has emerged as a clear leader.

However, neural networks are seen by many observers as the new wave of AI technology. The Mac's superior graphics and interactivity make it a platform more clearly suited to experimentation and exploration in this area. When designers get up to speed programming the relatively more complex Macintosh, the Mac could become the dominant platform for this technology.

The Mac is being taken seriously as an AI platform in both research and commercial circles. As AI is integrated with other business software solutions and the machine's graphical interface, rendering both more intuitive, current and future Macintosh users will find a machine that is even more accessible. •

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Third-party Mac hard disk drives

COMPANY	PRODUCT	INTERNAL OR EXTERNAL	DRIVE SIZE (MEGABYTES)	COMPATIBLE WITH WHAT MAC MODELS	NUMBER OF SCSI PORT PINS	DRIVE MECHANISM SUPPLIED BY	DISK SIZE (INCHES)	AVERAGE SEEK TIME (MILLISECONDS)	TRANSFER RATE (MBIT/SEC.)	CACHE MEMORY (KILOBYTES)	UTILITY SOFTWARE INCLUDED	CABLE LENGTH (FEET)	WEIGHT (POUNDS)	FOOTPRINT (LxWxH)	WARRANTY LENGTH	PRICE/ COST PER MEGABYTE
Aristotle Industries, Inc. **(604) 294-1113**	Hardpac 80, 105	External	80, 105	SE, II, IIX, IICX	25	Quantum	3.5	19	2-4	64	Disk Manager Mac	3	2.2	7.25 x 4.65 x 2	1 year	$1,795-$1,995/NP
ATG Gigadisc **(617) 935-2770**	NP	External	2000 or 6400	All	50	ATG	12	120	480KB	64	NP	NP	55	NP	1 year	$15,500/NP
Cache Systems Ltd. **(800) 525-6465**	Cache Hard Disc	External	81	Plus, SE, II	50	Seagate	5.25	28	1.2	None	Partitioning, interleave setting	1.5	7	9.75 x 9.75 x 2.5	1 year standard (optional 2 years)	$899/$11.10
	Cache Hard Disc	External	152, 320, 640	Plus, SE, II	50	Micropolis	5.25	16, 18	1.6	64	Partitioning, interleave setting	1.5	8.25, 12.75	9.75 x 9.75 x 2.5	1 year standard (optional 2 years)	$1,899-$4,499/ $12.49-$7.03
CMS Enhancements, Inc. **(714) 259-9555**	Macstack 100	External	102	All	25	Rodime	3.5	25	NP	None	Utility, backup, interleave settings, hard drive mounting, virus protection	3	4	11 x 10 x 3.5	1 year	$1,895/$18.95
	Platinum PL90-II/I, PL170-II/I, PL300-II/I, PL600-II/I	Internal	87.9, 172.8, 291.3, 584.9	II, IIX	50	CDC	5.25	16.5-18	NP	None	Same as above	None	5	None	1 year	$1,895-$5,795/ $9.66-$21.06
	Platinum PL100 IICX/I	Internal	102.9	IICX	50	Conner	3.5	25	NP	None	Same as above	None	3	None	1 year	$2,195/$21.95
	Pro 81-II/I, Pro 140-II/I	Internal	85, 138.7	II, IIX	50	Seagate, Rodime	5.25	26-28	NP	None	Same as above	None	4	None	1 year	$1,595-$1,995/ $14.95-$19.69
	Platinum PL100/I	Internal	102.9	SE, SE/30, II, IIX	50	Conner	3.5	25	NP	None	Same as above	None	3	None	1 year	$2,195/$21.95
	Pro 102/I	Internal	102	SE, SE/30	50	Rodime	3.5	25	NP	None	Same as above	None	3	None	1 year	$1,595/$15.64
	Pro 102 SE/R	Internal	102	SE, SE/30, II, IIX	50	Rodime	3.5	25	NP	None	Same as above	3	3	None	1 year	$1,595/$15.64
	Platinum Series PD90, PD170, PD300, PD600	External	87.9, 172.8, 291.3, 584.9	All	25	CDC	5.25	16.5-18.0	NP	None	Same as above	3	5 to 9	11 x 10 x 5.5	1 year	$5,995-$1,995/ $9.99-$22.17
	Platinum Series PD100	External	102.9	All	50	Conner	3.5	25	NP	None	Same as above	3	3	11 x 10 x 2.25	1 year	$2,395/$23.95
	Macstack 80, 140	External	85, 138.7	All	25	Seagate, Rodime	5.25	26	NP	None	Same as above	3	5	11 x 10 x 3.5	1 year	$1,795-$2,095/ $14.96-$22.44
Dolphin Systems Technology **(714) 558-3220**	Integra 80	External	80	All	50	Quantum	3.5	19	2	64	Backup, partitioning, interleave setting, diagnostics	3	8	10 x 10.5 x 2.5	1 year	$1,795/$22.40
	Integra 90, 170	External	90, 170	Same as above	50	Imprimis	5.25	18	2.5	None	Same as above	3	8, 10	10 x 10.5 x 2.5	1 year	$1,979-$2,549/ $21.98-$14.99
	Integra 100	External	100	Same as above	50	Conner	3.5	23	2.5	16	Same as above	3	8	10 x 10.5 x 2.5	1 year	$1,849/$18.49
	Integra 300, 600	External	300, 600	Same as above	50	Imprimis	5.25	16.5, 16	2	None	Same as above	3	14	10 x 10.5 x 6.5	1 year	$4,295-$6,045/ $14.31-$10.07
	Integra 80	Internal	80	SE, SE/30, II, IIX, IICX	50	Quantum	3.5	19	2	64	Same as above	0.83	2.5	None	1 year	$1,595/$19.93
	Integra 90	Internal	90	Same as above	50	Maxtor	3.5	25	2	None	Same as above	0.83	2.5	None	1 year	$1,795/$19.94
	Integra 100	Internal	100	Same as above	50	Conner	3.5	23	2.5	16	Same as above	0.83	2.5	None	1 year	$1,849/$18.49
	Integra 170, 300	Internal	170, 300	II, IIX	50	Imprimis	5.25	18	2.5	None	Same as above	0.83	4	None	1 year	$2,495-$3,395/ $14.67-$11.31
	Integra 300	Internal	300	II, IIX	50	Imprimis	5.25	16	2	None	Same as above	0.83	8	NA	1 year	$3,395/$11.31
DPI **(408) 945-1850**	DPI 90M-byte hard disk drive	Either	91	All	50	Maxtor, CDC	3.5 and 5.25	16.5	1.25	None	Apple utilities, 6.0.3. system formatter	3	9	12.5 x 3.5 x 6.5	1 year with 5-year option	$895-$995/ $9.94-$11.06
Ehman, Inc. **(307) 789-3830**	Ehman Hard Drive	Either	80	All	25	Seagate	3.5 and 5.25	23	1.5	None	Backup, partitioning, interleave setting, security	6	4.5	10 x 9.75 x 2.3	2 years	$399/$4.94-$11.19
EMAC, a division of Everex Systems **(800) 821-0807** **Ext. 2222**	Impact 80	External	84	All	50	Quantum	3.5	19	1.25	64	Disk manager, backup, system folder	1	Less than 4	10.5 x 6 x 2.5	1 year	NP
	EMAC-80ID	Internal	84	II, IIX	50	Quantum	3.5	19	1.25	64	Disk manager, backup	NP	NP	NP	1 year	NP
	EMAC-80CX	Internal	84	IICX	50	Quantum	3.5	19	1.25	64	Disk manager, backup	NP	NP	NP	1 year	NP
	EMAC-80 SE	Internal	84	SE	50	Quantum	3.5	19	1.25	64	Disk manager, backup	NP	NP	NP	1 year	NP
FWB, Inc. **(415) 474-8055**	Hammer 188, 300, 600	External	188, 300, 600	All	50	CDC	5.25	16.5	1.4-1.8	32	Backup, partitioning, security	1.5	8	9.75 x 9.5 x 5.5	1 year	$2,795-$5,895/ $9.82-$14.86
Jasmine Technologies, Inc. **(800) 347-3228**	Direct Drive 8	External	20, 40, 80, 100, 150, 300	All	NP	Many	5.25 (150 and 300 only)	17-68	1.5	8-32	Backup, partitioning, interleave setting, sum, disk management software	6	2-5	NP	2 years	$549-$2,795/ $9-$27.45
	Back Pac	External	NP	Plus, SE	NP	Many	3.5	17-68	1.5	8-32	Same as above	6	2-5	NP	2 years	$549-$2,795/ $9-$27.45
Julian Systems, Inc. **(415) 686-4400**	100I, 100X, 140I, 140X	Either	100, 140	External: all; internal: SE, II, IIX	50	Quantum, CMS	5.25	28	1.25	None	Interleave, formatting	3	6	12 x 12 x 3.5	1 year	NP
La Cie Ltd. **(800) 999-0143**	Cirrus 90	Either	93	All	50	Maxtor	3.5	27	1.5	48	Backup; partitioning; interleave setting; security; hard disk management, hard disk and modem sharing	2	4.5	3 x 6 x 9	2 years	$899/$13.31
	Cirrus 111, 142, 177	Either	111, 142, 177	All	50	CDC	3.5	15	1.25	32	Backup, partitioning, interleave setting, security, hard disk management, hard disk and modem sharing	2	4.5	3 x 6 x 9	2 years	$1,199-$1,799/ $10.16-$10.71
	Cirrus 84	Either	84	Same as above	50	Quantum	3.5	15	2	64	Hard disk management, hard disk and modem sharing	2	4.5	3 x 6 x 9	2 years	$999/$10.82
	Cirrus 613	Either	613	Same as above	50	CDC	5.25	15	1.25	NP	Same as above	1	15	9.5 x 9.5 x 4.5	2 years	$3,199/$5.21

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

COMPANY	PRODUCT	INTERNAL OR EXTERNAL	DRIVE SIZE (MEGABYTES)	COMPATIBLE WITH WHAT MAC MODELS	NUMBER OF SCSI PORT PINS	DRIVE MECHANISM SUPPLIED BY	DISK SIZE (INCHES)	AVERAGE SEEK TIME (MILLISECONDS)	TRANSFER RATE (MBIT/SEC.)	CACHE MEMORY (KILOBYTES)	UTILITY SOFTWARE INCLUDED	CABLE LENGTH (FEET)	WEIGHT (POUNDS)	FOOTPRINT (LxWxH)	WARRANTY LENGTH	PRICE/ COST PER MEGABYTE
Mac Products USA **(512) 343-9441**	Magic 80	Either	80	All	25 (ext.), 50 (int.)	Seagate	3.5 and 5.25	28	1.5	None	NP	6	Internal 2-3; external 6-7	11 x 10.25 x 2.5	1 year	$749-$799/NP
	Magic 91	Either	91	All	25 (ext.), 50 (int.)	Control Data	5.25	18	1.25	None	NP	6	Internal 4.5; external 8.5	11 x 10.25 x 2.5	1 year	$850-$950/NP
	Magic 150, 300, 600	Either	150, 300, 600	All	50	Control Data	5.25	16.5	1.25	None	NP	6	Internal 8; external 12	11 x 10.25 x 4.0	1 year	$1,395-$3,995/NP
	Magic 600 Read Write Optical	External	600	SE, SE/30, II, IIX, IICX	50	Ricoh	5.25	50	Read 0.3, Write 0.1	None	NP	6	12	11. x 10.25 x 4.0	1 year	$3,995/NP
Maxcess **(800) 356-2892**	Maxcess 100	Either	100	External: Plus, SE, II, IIX, IICX; internal: II, IIX	50	Quantum	3.5	19	0.9	64	Partitioning, interleave setting, security	1.5	Internal 1.9; external 4.8	3 x 8 x 6.5	1 year	$1,495/$14.95
	Maxcess 171, 300	Either	172, 300	Same as above	50	CDC, Imprimis	5.25	16.5-18	1.4	32	Same as above	1.5	Internal 4.2-7.2; external 8.1-11	9.5 x 9.75 x 2.4/5.5	1 year	$2,495-$3,495/ $14.51-$11.65
Mega Drive Systems, Inc. **(213) 556-1663**	Disk Pack	External	84, 105, 125	All	25	Quantum	3.5	13	4	64	Backup, interleave setting, security, formatting	3	2	2 x 4.3 x 7.3	1 year	$1,799-$2,699/$20
Micronet Technology, Inc. **(714) 837-6033**	Micro/Stack 80	External	80	All	2 to 50	Seagate	5.25	28	1.5	None	Password, partitioning, interleave setting, bad block spare	3	9	10 x 10.4 x 3.1	1 year	$1,245/$15.56
	Micro/Stack 88, 103, 173	External	88, 103, 173	All	2 to 50	Imprimis	5.25	18	1.5	None	Same as above	3	9	10 x 10.4 x 3.1	1 year	$1,795-$2,495/ $14.42-$20.39
	Micro/Max 292, 321, 587	External	292, 321, 587	All	2 to 50	Imprimis	5.25	10.7-16.5	1.5	None	Same as above	6	14	7.75 x 12 x 6.5	1 year	$3,595-$5,495/ $9.36-$13.69
	Micro/ Internal 80	Internal	80	SE, SE/30, II, IIX, IICX	None	Quantum	3.5	18	1.5	64	Same as above	None	3	4 x 6 x 1.6	1 year	$1,595/$19.94
	Micro/ Internal 80	Internal	80	II, IIX, IICX	None	Seagate	5.25	28	1.5	None	Same as above	None	5	6 x 8 x 1.6	1 year	$1,145/$14.31
	Micro/ Internal 88, 103, 173, 292	Internal	88, 103, 173, 292	II, IIX, IICX	None	Imprimis	5.25	16.5-18	1.5	None	Same as above	None	5	6 x 8 x 1.625	1 year	$1,645-$3,095/ $10.60-$18.69
	Micro/ Internal 130	Internal	130	SE, SE/30, IICX	None	Imprimis	3.5	15	1.5	None	Same as above	None	3	4 x 6 x 1.625	1 year	$2,045/$15.73
	Micro/ Internal 587	Internal	587	II, IIX	None	Imprimis	5.25	16	1.5	None	Same as above	None	9	6 x 8 x 3.25	1 year	$4,995/$8.51
Micropolis Corp. **(818) 718-7777**	1375, 1578, 1588 Mac Pak	Internal	145, 331,665	II, IIX	50	Micropolis	5.25	23, 18, 16	1.6	None	Partitioning, interleave setting	0.58	6	5.75 x 8 x 3.25	1 year	$1,535-$4,250/ $10.58-$6.39
	674, 684 Mac Pak	Internal	158, 339	II, IIX	50	Micropolis	5.25	16, 14	1.6	None	Same as above	0.58	5	5.75 x 8 x 1.6	1 year	$1,565-$2,535/ $9.90-$7.47
Microtech International, Inc. **(800) 325-1895**	Nova 80I, 100I	Internal	80, 100	SE, all IIs	50	Quantum	3.5	19	4	64	Backup, Mactree Plus	NP	2	NP	5 years	$919-$999/ $9.99-$11.48
	Nova 150I, 320I	Internal	150, 320	II, IIX	50	Micropolis	5.25	16, 18	4	64	Backup, Mactree Plus	NP	5, 8.4	NP	5 years	$1,399-$2,699/ $9.32-$8.43
	Nova 80, 100	External	80, 100	Plus, SE, all IIs	50	Quantum	3.5	19	4	64	Backup, Mactree Plus	2.5	6	2.5 x 9.6 x 10.5	5 years	$1,019-$1,099/ $12.73-$10.99
	Nova 150	External	150	Plus, SE, all IIs	50	Micropolis	5.25	16	4	64	Backup, Mactree Plus	2.5	9	2.5 x 9.6 x 10.5	5 years	$1,469/$9.79
Miniscribe **(303) 651-6000**	Winchester Hard Disk Drive 9380, 3180 SM	Internal	365, 175	II, IIX	None	Miniscribe	5.25	16-17	10	None	None	None	3.2-6	5.75 x 8 x 1.63	1 year	$1,899-$2,699/NP
Northern Telecom Memory Systems Division **(313) 973-4625**	Memorybank	External	Up to 940	All	50	Northern Telecom	8	16	1.5	64	Backup, partitioning, disk management, data restoration, diagnostics, audit trail for backup	5.25	80	10 x 24 x 22	2 years	$8,900-$17,900/$191
Ocean Microsystems, Inc. **(408) 374-8300**	Voyager	External	88	Plus, SE, SE/30, II	50	Syquest	5.25	25	Up to 1.5	4	Test, format, install, backup, restore	3	9-13	NP	1 year	$1,750-$3,095/$3
Optimal Technology Corp. **(800) 637-0088**	Optima 80	Either	80	External: all; internal: SE, SE/30, II, IIX, IICX	50	Quantum	3.5	12	2	64	Backup, interleaf setting, diagnostics, formatting, SCSI scanner, performance testing	2-6	Internal 1.5; external 8	9.5 x 9.5 x 2	2 years	$819-$919/ $10.23-$11.48
	Optima 105	Either	105	External: all; internal: SE, SE/30, II, IIX, IICX	50	Quantum	3.5	12	2	64	Same as above	2-6	Internal 1.5; external 8	9.5 x 9.5 x 2	2 years	$949-$1,049/ $9.03-$9.99
Osicom Technologies,Inc. **(800) 922-0881**	Macbest	Either	80-600	All	50	Seagate, Miniscribe, CDC, Imprimis	3.5 and 5.25	17-28	1.5-2.0	NP	Partitioning, diagnostics	3	Depends on model	10 x 10 x 3	1 year	$595-$5,095/NP
Peripheral Land, Inc. **(800) 288-8754**	3001, 6351 Turbo	Internal	300, 635	II	NP	CDC	5.25	16	9-15	4	Turbo backup, spool, cache, optimizer	None	NP	NP	1 year	$3,695-$5,895/NP
	300E, 635E Turbo FH External	External	300, 635	Plus, SE, II, IIX, IICX	50	CDC	5.25	16-18	9-15	4	Same as above	1.5	7, 12	9.75 x 9.75 x 4.72	1 year	$3,795-$5,995/ $9.44-$12.65
	901 Turbo Mac II IMP	Internal	90	II	50	CDC	5.25	18	10	4	Same as above	None	NP	NP	1 year	$1,595/$17.72
	160I Turbo	Internal	160	II	50	Miniscribe	5.25	17	4	4	Same as above	None	NP	NP	1 year	$1,995/NP
	90E Turbo IMP External	External	90	Plus, SE, II, IIX, IICX	50	CDC	5.25	1.5	10	4	Same as above	18	7	9.75 x 9.75 x 2.37	1 year	$1,795/$19.94
	90I Turbo Mac II 3.5	Internal	90	SE, II, IICX	50	Maxtor	3.5	27	8	4	Same as above	None	NP	NP	1 year	$1,595/$17.72
	160E Turbo External	External	160	Plus, SE, II, IIX, IICX	50	Miniscribe	5.25	17	4	4	Same as above	1.5	7	NP	1 year	$2,195/$13.71
	90E Turbo	External	90	Plus, SE, II, IIX, IICX	50	Maxtor	3.5	27	9	NP	Turbo spool, back, cache	1.5	7	9.75 x 9.75 x 2.37	1 year	$1,695/$18.83

COMPANY	PRODUCT	INTERNAL OR EXTERNAL	DRIVE SIZE (MEGABYTES)	COMPATIBLE WITH WHAT MAC MODELS	NUMBER OF SCSI PORT PINS	DRIVE MECHANISM SUPPLIED BY	DISK SIZE (INCHES)	AVERAGE SEEK TIME (MILLISECONDS)	TRANSFER RATE (MBIT/SEC.)	CACHE MEMORY (KILOBYTES)	UTILITY SOFTWARE INCLUDED	CABLE LENGTH (FEET)	WEIGHT (POUNDS)	FOOTPRINT (LxWxH)	WARRANTY LENGTH	PRICE/ COST PER MEGABYTE
Personal Computer Peripherals Corp. **(813) 884-3092**	Macbottom HD84	External	83.9	Plus, SE, II	25	Quantum	3.5	19	Up to 1.5	64	Backup, archive and restore, utilities and diagnostics, print spooler, floppy copy	6	5	9.5 x 9.5 x 2	2 years	$1,595-$2,395/ $9.03-$9.99
Priam Corp. **(408) 434-9300**	Priam Macdisk	External	250, 330	Plus, SE, II	50	Priam	5.25	18	1.3	NP	Interleave, setting	4	13	13.7 x 4.8 x 7.7	1-3 years	$3,493-$4,235/ $13.20-$13.90
Procom Technology, Inc. **(714) 549-9449**	Hi Performance Internal 80	Internal	80	SE, SE/30, II, IIX, IICX	50	Y-E Data	3.5	12	1	16	Backup, interleave setting, initialization, testing	0.66	1.5	4 x 5.75 x 1.6	1 year	$1,495/$18.68
	Hi Performance Internal 100	Internal	100	SE, SE/30, II, IIX, IICX	50	Conner	3.5	25	1.25	None	Same as above	0.66	1.5	4 x 5.75 x 1.6	1 year	$1,595/$15.25
	Hi Performance Internal 330	Internal	330	II, IIX	50	Micropolis	5.25	16.5	2	None	Same as above	8	0.88	5.75 x 8 x 3.25	1 year	$4,345/$13.16
	Hi Performance External 80	External	80	All	25	Y-E Data	3.5	26	1.1	16	Same as above	1.5	9	9.75 x 10.25 x 2.25	1 year	$1,650/$20.60
	Hi Performance External 100	External	100	All	25	Conner	3.5	25	1.2	None	Same as above	1.5	9	9.625 x 10.25 x 2.25	1 year	$1,850/$18.50
	Hi Performance External 330	External	330	All	25	Micropolis	5.25	16	2	None	Same as above	1.5	12	7.5 x 11.75 x 6.75	1 year	$4,645/$14.07
	Hi Performance External 650	External	650	All	25	Micropolis	5.25	16	2	None	Same as above	1.5	12	7.5 x 11.75 x 6.75	1 year	$6,995/$10.76
Prostor **(415) 974-6462**	Transpac 80, 100, 200	External	80, 100, 200	All	25	Quantum, Maxtor, CDC	3.5	15	930K	None	Partition, backup	8	2-4.5	NP	1.5 years	$2,350-$3,295/NP
Racet Computers Ltd. **(714) 579-1725**	Director Series	External	320-731 (up to a 1462 in a single)	All	50	NP	5.25	18	2.4	4M to 12M	Backup, partitioning, interleave, sector size	Up to 5	NP	28 x 11 x 28	1 year	$5,495-$21,495/ $23
	Gigastore	External	150M - 17.5G	All	50	NP	5.25	16	1.5	512	Same as above	1.5	40	13 x 16 x 11	1 year	$11,995-$5,495/ $8-11
	Stand-Alone Series	Either	190, 150, 338, 600, 650	All	50	NP	5.25	16	1.5	69	Same as above	0.6-1.5	15	1 x 5 x 15.3	1 year	$7,495-$7,995/ $3-$5
Rodime Systems **(407) 994-5585**	Cobra 100E, 100I, 210E, 210I	Either	105, 210	SE, SE/30, II, IIX, IICX	50	Rodime	3.5	18	1.25	16	Partitioning, password protection, media verification, formatting and driver installation, backup	2	2-6	9.7 x 10.4 x 2.4	1 year	$1,849-$2,549/ $17.61-$12.14
Ruby Systems, Inc. **(800) 888-1668**	Star Drive 30DX-160DX	Either	30-160	All	50	Quantum, Seagate, Imprimis, Conner	3.5 and 5.25	18	1.25	64	Format, partition, interleave, password, backup	2 or 6	8	10 x 10.5 x 3	1 year	$549/$14
Storage Dimensions **(408) 879-0300**	Macinstor External High Capacity 320, 345, 650	External	324, 345, 650	NP	50	Maxtor	5.25	14.5-6.5	1.25-1.875	NP	Diagnostic, partitioning, backup, disk optimization, data encryption and recovery	1.5	NP	15 x 7.5 x 4	1 year	$4,499-$7,999/ $13.89-$12.31
	Macinstor External High Capacity 595	External	594	NP	50	CDC	5.25	16	1.125-1.875	NP	Same as above	1.5	NP	15 x 7.5 x 4	1 year	$6,499/$10.94
Tallgrass Technologies Corp. **(800) 825-4727**	Travel Pac 100	External	101	All	25	Rodime	3.5	22	937K	4	Interleave setting, disk tools plus	6	2.5	4.5 x 7.5 x 2.1	1 year	$1,895/$18.76
	TG-100 SDI; 100 SDE	Internal	101	All	50	Rodime	3.5	22	937K	4	Same as above	1	2	None	1 year	$1,895-$2,195/ $21.73-$18.76
	TG-200 SDDE	External	202	All	50	Rodime	3.5	22	937K	4	Same as above	3	12.2	4.88 x 9.35 x 7.68	1 year	$4,095/$20.27
Total Systems, Inc. **(805) 582-3240**	Maccider 100	External	100	Plus, SE, II	50	Connor, Seagate	3.5	28	1.25	16	Format, initial, test and verify, SCSI ID search and evaluator	2	3	5.25 x 7.5 x 2.5	1 year	$999/$25
Trimarchi, Inc. **(800) 356-6638**	Data Keg Twin Sixes	External	600	SE, II	50	CDC, Micropolis	5.25	16	1.2	64+	Standard disk driver	6	15	14.25 x 12.75 x 5.375	1 year	$7,995/$6.66
	Data Keg 600; 1300	External	600; 1300	SE, II	50	CDC, Micropolis	5.25	16	1.2	64+	Standard disk driver	6	15	11.3 x 12.8 x 6.9	1 year	$3,300-$4,245/ $10-$7
Westcom Computer Systems **(800) 422-8591**	WI 100+	Internal	100	SE, Plus, II	50	Quantum	3.5	19	None	NP	Backup, partition, interleave, security, install SCSI test	None	3	None	1 year parts, lifetime service	$925/$9.25
	WI 160	Internal	152	II	50	Miniscribe	5.25	19	None	NP	Same as above	None	6	None	1 year parts, lifetime service	$1,199/$11.99
Western Digital Corp. **(714) 863-0102**	Preference Hard Disk 120AP, 80AP	External	118, 82	All	25	CDC, Imprimis, Microscience	3.5	15	200K-1M	32	Formatting, initializing, backup, Apple system 6.0.2 and utilities	1.5	5	6.79 x 8.08 x 3.1	1 year	$1,695-$2,395/ $21.18-$19.95

Systems analysts for the '90s

The best will have liberal arts, business — and technical — training

BOB DAHM

BY ALFRED B. HURD

What will systems analysis look like in the years to come? The climate that information systems managers and their companies operate in today — with its increased rate of change, new and distributed technology and competitive pressures — foreshadows the climate of the next decade.

This environment will require different approaches to systems development and the analysis that underlies effective systems. IS has not yet finished learning how to do all that must be done to get ready for this scenario, but some conclusions are clear:

- Sound systems analysis will always be important.
- Systems will be developed in short segments by small teams consisting — at least — of a technician, an analyst and a subject-matter expert. These skills might even be found in one person.
- The best systems analysts will have a liberal arts background, technical training and a creative, business-centered approach dedicated to producing systems with competitive advantage.

Systems development

For many years, the systems development life cycle (SDLC) has included some or all of the following basic elements: requirements analysis, external design, internal design, program development, system test, start-up and installation, operation and maintenance and postaudit. Most shops had their own versions, but the essentials were the same and included a lot of user contact through the analysis (external design) phase, little or none while the system was being designed and renewed user contact at turnover time — often months later.

IS created systems this way because computers were scarce, and it seemed that the process was similar to building a house: The analyst was the architect, the designer was the contractor, and the coders were the tradesmen.

When this script is followed today, information systems finds that a problem arises in the flow of events. While the IS staff is building a system whose design has been fixed, the user department continues operating in a changing business world. At systems delivery time, the user and IS personnel often find themselves in different places. What seemed useful months ago could now be out of date.

'Industrial products'

Dudley Cooke, president of Executive Insight Group in Bryn Mawr, Pa., and former IS chief at Sun Company, Inc., calls the results of such lengthy systems development projects "industrial products." IS needs to build "consumer products" instead — offerings that are user focused, have limited scope and can be completed quickly at modest cost.

The industrial product approach to systems development no longer applies because information systems now permeates most organizations in the form of personal computers and terminals. Today, IS needs to develop systems one part at a time, jointly with users, so the users can experience results soon and IS can stay with them as their business unfolds.

Part of the problem is that today's users — even when they try — do not always know what they want. So, for example,

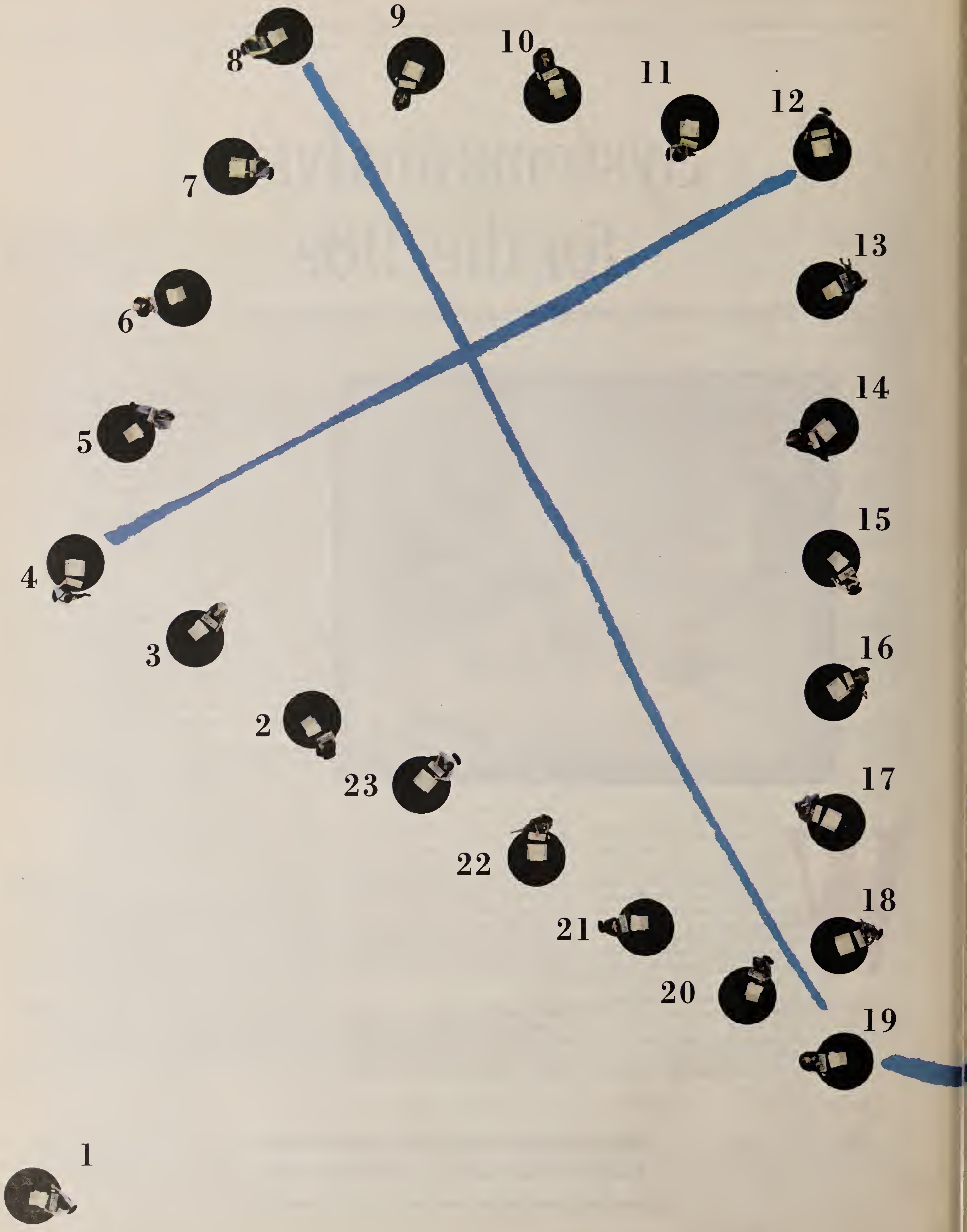
---

Hurd is managing consultant at ABH Associates, a project management, systems analysis and organizational development consultancy located in Moylan, Pa.

• Beware preferring activity over thought

• Analysis occurs early, or users pay later

• Creating consumer, not industrial, products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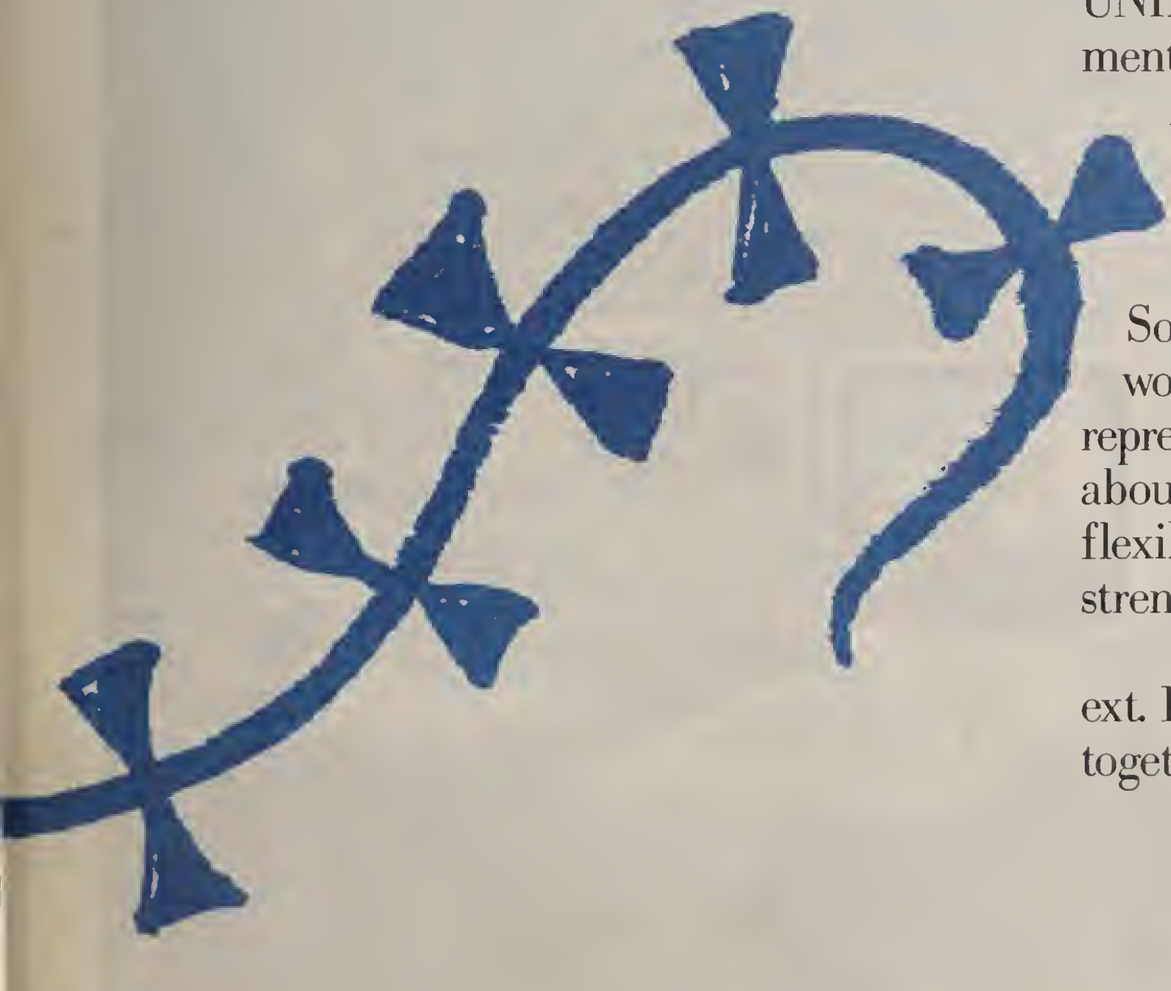

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prototyping can be used to show them how a system might work and help them test the application of technology to business problems. Fortunately, systems are not built of lumber but of electronic material that can be readily changed.

Thus, in the future, instead of one long SDLC for an entire system, there will be several short SDLCs, each devoted to a part of the whole.

Is analysis critical?

Users have always itched for results, and IS managers have had to defend the value of analysis — that is, the value of thinking about what the current system does and what the new one should do. Maunallen Gregory, vice-president of MIS at Alco Standard Corp. in Valley Forge, Pa., notes that American business' preference for activity over thought amounts to a national problem. This attitude has been enshrined in the IS world as "WISCA" — "Why Isn't Sam Coding Anything?"

Yet IS as well as corporate management should remember that thinking is critical to system building. The systematic thinking required for successful systems development begins with understanding how the current system — or system segment — operates and continues by relating it to the business as a whole. It ends when an operational prescription combining understanding, related general business knowledge and creativity has been written for the system's designers.

> FORTUNATELY, systems are not built of lumber but of electronic material that can be readily changed.

This prescription identifies the essential structure of the process, saves what is useful from the current system — whether it is manual or automated — and adds or subtracts elements to improve efficiency and effectiveness.

Time pressure should not change this standard; methodologies such as structured analysis or decision tables will speed the work but cannot substitute for curiosity, insight and thought. The phrase "pay me now, or pay me later" applies absolutely; the best (and cheapest) time for analysis is early in a system's development.

The idea that launches a systems development effort contains some analysis, but the full-dress effort takes place during the second phase of the SDLC. This phase is interchangeably called functional design, external design or analysis. Sometimes, it is part of "general design," which, regrettably, mixes analysis with design.

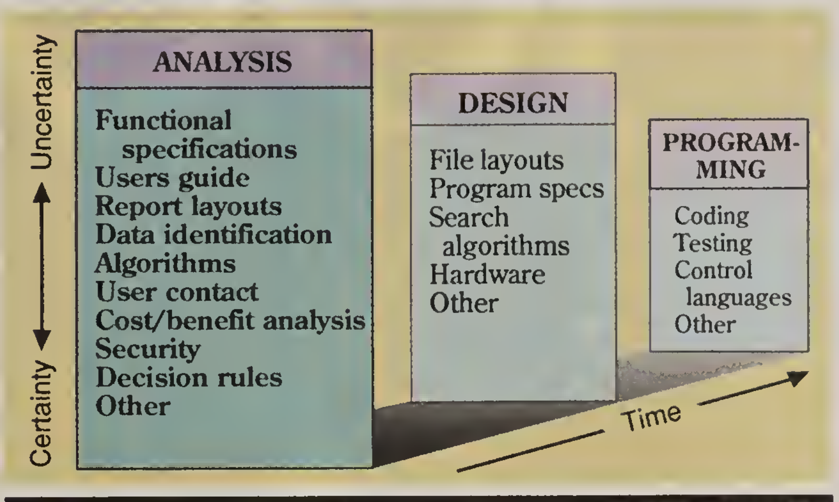
Small fraction

In any case, analysis typically requires 6% to 8% of the time that is spent on the whole development effort — not a large fraction. Yet anyone who has built anything from a birdhouse to a building knows that a minimum of thought is required just to make the structure workable and that more thought makes the structure really useful, efficient or even elegant. Thorough analysis at the outset has enormous positive leverage on system quality and development costs.

Experience shows that analysis invariably continues at some level to the end of systems development, but the price increases as time goes by. Simply put, costs go up when IS has to rework a system because new ideas arise later. Obviously, the goal for IS should be to minimize the need for later analysis.

Running the gamut

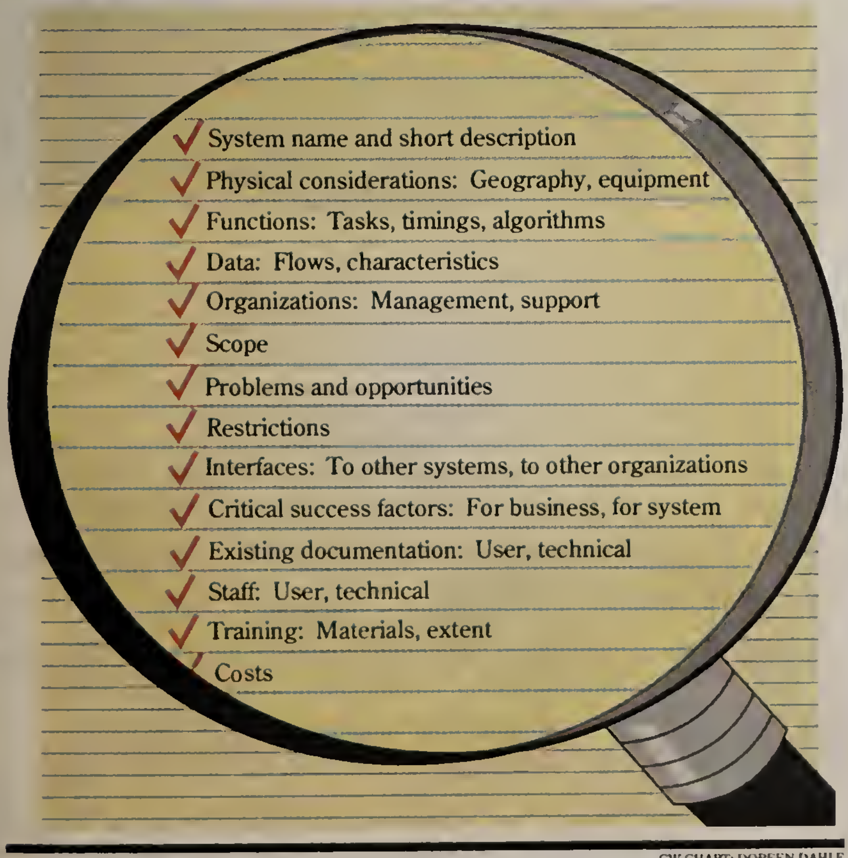
Over the life of a system, development technical tasks include design and programming as well as analysis, and they cover a range of functions from the obvious to the obscure



CW CHART: DOREEN DAHLE

Systems definition

Analysts use a checklist like the one below to describe the current system and to set up the new system


✓ System name and short description
✓ Physical considerations: Geography, equipment
✓ Functions: Tasks, timings, algorithms
✓ Data: Flows, characteristics
✓ Organizations: Management, support
✓ Scope
✓ Problems and opportunities
✓ Restrictions
✓ Interfaces: To other systems, to other organizations
✓ Critical success factors: For business, for system
✓ Existing documentation: User, technical
✓ Staff: User, technical
✓ Training: Materials, extent
Costs

CW CHART: DOREEN DAHLE

Analysts are concerned with what the current system does and what it should do. System designers, by contrast, deal with how the new system will work; programmers then build it. Of course, in reality, analysts are seldom free of design knowledge because most of them come from technical backgrounds.

Nevertheless, the more analysts can separate the "what" from the "how," the better they can focus on elements critical to a system's success without the restraints of available technology. Premature design can cripple analysis.

Analysts organize and structure the imperfect real world with its exceptions and uncertainties so that computers can apply their power to make the work go faster, better or both. The easiest manual applications are already systematic when the analyst arrives — early payroll systems, are an example. But it is rarely possible now to design such a system; all the easy applications have been turned into packages.

The tasks of analysis

To understand the current system, the analyst needs a partnership with subject-matter experts from the user department, including managers and those who work with the current system.

The ability to learn quickly is an analyst's stock-in-trade, and many tools can help: structured analysis with its data-flow diagrams, decision tables that require completeness, logs, histories and operator job aids — it's a long list.

The best analysts search for evidence tirelessly. Whenever the process seems unclear or results are unexplained, the analyst asks, how do things really get done? The answers to this question point to what is known as the informal system. It takes time to learn how the informal system operates. Later, the formal systems definition document (see chart below) outlines what the analyst looks for to describe both the current system and the new system.

In addition, the analyst needs to know how other companies have implemented systems similar to the one currently under development. Effective analysts specialize in a subject area such as manufacturing, finance or distribution.

When starting to analyze a system need, the analyst describes the current system, addressing all the items listed in the systems definition document.

> PROBABLY THE BEST recruit for the job of analyst is a business journalist or an MBA with a liberal arts background. These people understand data gathering, synthesis and writing; they respect evidence, they value planning, and they have broad business knowledge.

Here, truth-telling is vital, and the analyst must have the support of the IS manager. If the analyst verifies the data gathering and interviews as each is completed, few users will quarrel with the facts. When all has been certified, and conclusions about what is valuable or useless in the current system are settled, the analyst has a solid foundation for progress.

Next, the analyst writes, in functional terms, about the system as it should be, again using the systems definition document.

At this point, even more than when describing the current system, the analyst's ideas for change will be debated. People always find it hard to change, and it will take evidence, salesmanship and competitive pressure to make the new system different from the old in the users' eyes.

To this end, analysts operate with a wide range of functional skills, from the certain to the uncertain, and accomplish tasks that vary from detailed data gathering to creating functions that never were before (see chart at left). Because of this obstacle, few people actually excel in analysis; IS technical people tend to be most comfortable at the "certainty" end of the spectrum.

Indeed, it is hard — if not impossible — for former programmers not to think about implementation when they should be concentrating on functions and not to abandon good ideas that seem troublesome to implement.

Programming is not the best preparation for analysis, although most information systems shops have that as their promotion path. The great strength of a technical background is the ability to think systematically and to value detail.

Breadth of understanding

However, the critical element for analyst excellence is breadth of understanding — understanding the company, the business and the application. Knowledge of the application means that a subject-matter expert does not have to explain every detail of a current system for an analyst to understand it.

The same knowledge provides ideas about solutions to similar problems addressed by others. Most important, an analyst with a general business background can see how the proposed system can provide competitive advantage. Knowledge of the organization can help the analyst fit the new system into the business as a whole and ensure that it connects with current or planned systems in other areas.

Probably the best recruit for the job of analyst is a business journalist or an MBA with a liberal arts background. These people understand data gathering, synthesis and writing; they respect evidence, they value planning, and they have broad business knowledge.

Many current analysts were first technicians, and some do very well at it; many do not. It is up to the information systems manager to make them better, saving what is valuable in technical training and combining it with business insight and creative thinking. IS is the

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responsible party when it comes to developing the analysts of the future.

TODAY'S ANALYSTS ARE chiefly former technicians, but with the spread of computer literacy, more users will want to do their own analysis. And why not?

Good blend

How can IS help? First, realize that the excellent analyst knows what business his company is in, understands the application currently under study and its relationships with other corporate systems and can pursue details when they are needed.

Such a person combines the best of broad business experience with a technician's tolerance for detail. What IS can do to cultivate this type of analyst is to broaden the skills base of those who have only a technical background by assigning them to specific client areas.

Alternatively, IS needs to show general businesspeople the value of systematic thought by training them in analysis tools.

Obviously, today's analysts are chiefly former technicians, but with the spread of computer literacy, more users will want to do their own analysis. And why not? They have the expertise and established relationships within their organization, they understand the politics, and they will own the new system.

However, they may lack the time to devote to the new project (because they have an ongoing job), they may not be objective, they may lack analytical skills, and they probably have little knowledge about other company systems and databases.

Currently, the best arrangement puts an IS analyst to work with a subject-matter expert. In the future, IS managers should select analysts with liberal arts or business backgrounds, assign them to user areas and eventually promote them into those areas as resident analysts. Because users are computer literate, IS can train and build what the users envision.

However, the needs of the company — and of the IS department — will be best served by IS analysts working directly in user departments.

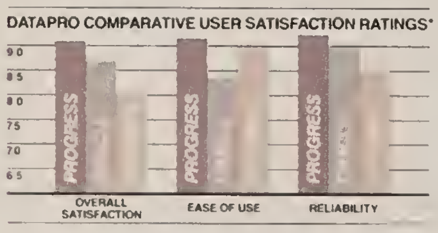
Palmer Dalesandro, director of IS at Thomas Jefferson University in Philadelphia, points out that it is an IS manager's job to unify systems and data across the company despite the natural inclination of users, who may want to make their systems exclusive.

A connected vision

Indeed, many users will neither want to connect their systems with other departments nor share data. Therefore, IS should cultivate this vision of a connected company and should take the responsibility for implementing it.

Analysis will always be invaluable, and as computer literacy increases and technology spreads, IS managers will serve their companies well by training and installing in user departments system generalists with broad backgrounds and a business point of view.

There, this new breed of analyst — groomed for the 1990s — can work jointly with users on short system development projects dedicated to making the company more competitive and its systems even more mutually supportive. •



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COMPUTER INDUSTRY

INDUSTRY INSIGHT

Glenn Rifkin

Clogged arteries

I eased my car through the toll booth and onto the dreaded rush-hour parking lot known as Rt. 128 going south. Commuters sat with drained looks on their faces in the 93-degree heat. The traffic jerked and halted. Undoubtedly, very few of these bedraggled drivers were thinking about the fact that they were mired on "America's technology highway."

The irony struck me, however. Rt. 128, just a few years ago the symbol of bright promise for the region's high-tech gold mine, has become a clogged artery. Suddenly, the fast, powerful cars that zipped along at peak speeds are stuck; a few are collapsed in the breakdown lane, and others have already been dragged away by the technology tow trucks.

Now anyone who regularly sits in that sister parking lot, Rt. 101, as it winds its way from San Jose, Calif., up toward San Francisco, knows that traffic-jam metaphors are probably inappropriate. The faces of those crazed commuters are no happier than their counterparts back East. But inside the Mercedes 450 SLs, the young executives on their cellular phones at least know where they are going. They know that not only is their company still waiting for them when they make it through the traffic but that the Silicon Valley dream is alive and well and giving birth to continued new ventures.

In this bleak time for Rt. 128, arguably its nadir, the high-tech community has to ask itself whether the dream is gone or a spark of fighting spirit remains.

In Billerica, Chelmsford,

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- Nissan looks to Reynolds' Partsvision system. Page 79.
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Telesoft to merge with Swedish firm

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Telesoft, one of the major U.S. vendors in the Ada software market, last month announced an unusual agreement to merge with a subsidiary of the Swedish Telecommunications Administration [Swedish Telecom] and form an international firm devoted to the software engineering market.

San Diego-based Telesoft, a privately held and profitable business valued at $40 million, will be bought by Swedish Telecom's Teleinvest subsidiary, a group of businesses that act very much like private companies even though their parent is a government-run telecommunications monopoly.

Goodwin *will remain as president, CEO at Telesoft AB*

Telesoft and one of those business units, Telelogic AB of Stockholm, will merge this month to form Telesoft AB, with projected 1989 revenue of $60 million and 600 employees worldwide.

Ben Goodwin Jr., who has been president and chief executive officer of Telesoft since 1985, will hold the same titles at Telesoft AB, although he will have to split his time between the Stockholm headquarters and the U.S. operation based in San Diego.

In an interview here, Goodwin said he was assured that merging with a government-controlled company would not result in burdensome regulatory oversight. Besides, he said, in about three years, Telesoft AB plans to go public on the U.S. and Swedish stock exchanges, which will place control in the hands of stockholders.

Telelogic supplies software development tools for the telecommunications industry and factory automation. Telesoft has specialized in producing compilers and other tools for Ada, the U.S. Department of Defense programming language known for its enforcement of good software engineering practices.

Continued on page 78

Execs spar over antitrust exemption

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Conventional wisdom holds that the U.S. needs high-technology consortiums to be more competitive against Japan, but one industry executive has issued a vigorous dissent.

T. J. Rodgers, president of Cypress Semiconductor Corp. in San Jose, Calif., told the U.S. House Judiciary Committee late last month that it should resist the pleas of U.S. Memories, Inc. for an antitrust exemption allowing the consortium to manufacture dynamic random-access memory (DRAM) chips.

The Cypress executive charged that the antitrust legislation and possible federal loan guarantees represent a government subsidy for seven wealthy chip makers who have joined U.S. Memories, including IBM and Intel Corp. [CW, June 26]. He said that young, entrepreneurial companies such as Cypress will be facing competition not only from Japan but also from "a U.S. government-subsidized, Japanese-like cartel in the U.S."

However, the antitrust exemption was supported in joint testimony by the Semiconductor Industry Association and the American Electronics Association. Intel Chairman Gordon E. Moore said joint production ventures allow U.S. companies to re-enter lost markets by sharing costs and risks and developing economies of scale.

"By pooling their resources and technology with respect to a given product, U.S. producers can take the risks necessary to stand up to the Japanese and achieve the staying power to hang on when times are bad," Moore testified.

He said it is hard enough to get U.S. chip makers to put aside their rivalries and act cooperatively against a "common foe." Adding potential antitrust liability makes cooperation virtually impossible, Moore said.

Rodgers countered that although U.S. Memories claims it will stick to the DRAM market, it may drift into the static random-access memory market as well. Then, he said, the consortium will be "competing with my company and the hundreds of other semiconductor companies in the U.S. that do not enjoy the luxury of antitrust immunity and subsidies."

Congress is now considering several bills aimed at extending the National Cooperative Research Act of 1984, which provides antitrust protection for joint research ventures, to cover manufacturing consortiums.

The legislative effort got the support of Commerce Secretary Robert A. Mosbacher, who testified that "cooperative arrangements may allow firms to share risks, spread high commercialization costs and respond flexibly to changes in competitive conditions."

Antitrust expert Thomas M. Jorde agreed. Jorde, a professor at the University of California at Berkeley, testifed that joint production ventures are especially vulnerable to private suits for triple damages as well as government enforcement actions.

"Until further legislation is passed, U.S. firms are likely to muddle along with inadequate, uncoordinated and unfocused separate initiatives while foreign competitors take the lead," Jorde said.

Owner of mail-order firm is stamped for fraud trial

BY RICHARD PASTORE
CW STAFF

TAMPA, Fla. — The former owner of a personal computer mail-order firm will stand trial this month on charges of intentionally failing to fill more than $50,000 in computer orders.

Robert G. Norton of Venice, Fla., was charged in U.S. District Court with 15 counts of mail and wire fraud for allegedly taking money from customers, suppliers, banks and credit card companies and failing to ship the computers his customers ordered, said Andrew Grosso, assistant U.S. district attorney in Tampa.

Norton is also accused of diverting company funds to pay for his personal yacht, a Las Vegas condominium and a luxury car.

Norton's company, Compumart, operated in Venice from the end of 1984 through March 1986, when it filed for bankruptcy. The fraud is alleged to have taken place in 1985, and Norton was indicted in 1987. George Campbell, postal inspector for the Tampa area, brought the charges against Norton. He said he believed that Compumart advertised in national computer publications, including *PC World* and *Computerworld.*

"The indictment says that Compumart initially was legitimate. It got in financial problems, and the company began to lie to customers in order to keep afloat," Grosso said.

If found guilty, Norton, who is now living in Miami, could face a jail term of five years and a $250,000 fine for each of the 15 counts.

Dissatisfied customer

Matt Smith, while a manager at International Data Group-Peterborough in New Hampshire, said he noticed a Compumart ad in *PC World* and ordered three Compaq Computer Corp. machines from the mail-order house.

"They said they had to have a check up front, so naive me sent them a check," said Smith, who is now vice-president, operations at CW Publishing. He said he received one machine, but the other two never showed up.

"I kept calling and calling, and finally I was so disgusted with them because they weren't answering my questions that I called the Florida attorney general, and they had a big file on these people," Smith said.

He added that two weeks later, "I got a letter that they had filed for bankruptcy and ate $4,000 of our money." Smith has been subpoenaed to testify at the Norton trial, which has been postponed twice.

AT&T gets go-ahead to offer on-line information services

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — AT&T will be able to compete against IBM's Prodigy videotex service or any other on-line information service, now that U.S. District Judge Harold H. Greene has lifted the seven-year ban he imposed under the AT&T divestiture judgment.

AT&T said it was pleased by Greene's July 28 ruling, which allows the ban to expire Aug. 24, but declined to specify what new businesses it may enter.

"This signals that another one of the real big boys is ready to play in the [information services] marketplace," said Bernell Wright, an electronic communications analyst at Link Resources Corp., a market research firm in New York.

Wright said AT&T has been conducting research on possible information services in anticipation of Greene's ruling. Now, AT&T will have to decide whether to pump resources into the consumer market — such as starting a videotex or telemarketing service — or the business market, he said.

In the business market, AT&T has hinted that it would like "to buy into the exploding financial-services information market," Wright said.

Banking service in works

AT&T already has a relationship with Telerate, Inc. to develop a service to help bankers execute currency trades. (Sixty-seven percent of Telerate is owned by Dow Jones & Co., based in New York.)

Greene said that lifting the ban on "electronic publishing" by AT&T was warranted because, since divestiture, AT&T has come to face considerable competition from the likes of MCI Communications Corp. and U.S. Sprint Communications Co. as a long-distance carrier of voice and data transmissions.

> AT&T HAS BEEN conducting research on possible information services in anticipation of Greene's ruling.

Greene had imposed the seven-year ban in recognition that as long as AT&T was the dominant pipeline to consumers, it could unfairly compete against other firms in the fledgling information-services industry.

AT&T, the U.S. Department of Justice and the Federal Communications Commission reported to Greene that AT&T now faces vigorous competition, a contention that was not disputed by other commenters.

As the Justice Department put it, "If AT&T were to attempt to discriminate in access to its network in favor of its own electronic publishing services, competing electronic publishers could simply turn to alternative service providers."

Telesoft

CONTINUED FROM PAGE 77

The two merger partners have had a history of collaboration on technology development for about four years, and Teleinvest currently owns 29% of Telesoft.

The new company is expected to focus on supplying programmer productivity tools based on Ada to the aerospace, telecommunications, military and factory automation markets. Goodwin cited several advantages to the merger, such as opening a U.S. distribution channel for the Swedish partner's products and exploiting Telelogic's expertise in the telecommunications industry.

> TELESOFT HAS started to expand beyond Ada compilers and focus more broadly on the computer-aided software engineering market.

Furthermore, he said that the merged company will be in a good position to work with multinational firms. Telesoft AB will inherit a Brussels office for the European market and will soon open an office in Japan, Goodwin added.

Telesoft has recently started to expand beyond Ada compilers and focus more broadly on the computer-aided software engineering market. So far, its products have fallen mostly in the middle and back end of the software life cycle, but Goodwin said Telesoft AB will pursue alliances and acquisitions to obtain front-end design tools as well.

Telesoft's Ada programming tools are involved in such major projects as development of the Federal Aviation Administration's advanced air-traffic control system and the U.S. Air Force's Advanced Tactical Fighter program.

Codex forges
Codex Unveils Dual
By Matt Kramer
Codex Corp. last week introduced new firmware that permits its 2600 Series leased-line modems to be managed concurrently by IBM's NetView and Codex's management system.
NETW
Week®
The Newsweekly o
Fairchild Business Newspaper • Monday, May 15, 1989
Volume 6, Number 19
Codex forges a direct link to NetView
By Paul Desmond
Staff Writer
IBM MAY RE
Code
IBM'
By JEANNE IID
FROM LINCOLN

Just a few of Dual

THE BEST MODEM FOR NETVIEW ISN'T FROM IBM.

When we announced the new DualView Management Option for 2600 Series modems, it made big news.

And the biggest news is, for the first time you can choose a modem for NetView based on capability instead of compatibility.

So if you need a leased-line modem for NetView at speeds up to 19.2 kbps, now you can get it with DualView. Along with an integral time division multiplexer, fully automatic dial back-up, and other exclusive features.

DUALVIEW MAKES NETVIEW WORK BETTER.

DualView expands NetView's modem management capabilities with 10 unique built-in features unavailable on IBM modems.

Plus DualView totally bypasses NetView/PC, so you can monitor your modem network directly from NetView.

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Reynolds to develop parts catalog

BY ALAN J. RYAN
CW STAFF

DAYTON, Ohio — The Reynolds and Reynolds Co. has furthered its penetration of the automotive systems marketplace by signing an agreement to develop and market an electronic parts catalog system for Nissan Motor Corp.'s 1,100 dealers in the U.S.

Reynolds co-markets its systems to automobile dealers with Bell & Howell Co., which developed the hardware platform for the Partsvision system, according to Steve Otto, product manager of image-based systems at Reynolds. Bell & Howell's product is called IDB 2000.

Together, Reynolds and Bell & Howell have released electronic parts catalog systems for General Motors Corp. dealers in the U.S. and Canada and for Chrysler Corp. and Acura/Honda Motor Co. dealers in the U.S. They are also developing similar systems for Volvo North America Corp. and Mercedes-Benz of North America, Inc. dealers in the U.S.

Otto said the Partsvision system will allow the dealers to automate the processes of looking up parts numbers, locating parts on shelves, finding out pricing information, creating bills and maintaining inventory control.

Additionally, the system will assist the dealers in ordering more stock. Otto said the Reynolds system can create a sales order based on both the current inventory and history of parts sales at the dealership. The dealer has the option of modifying the order, after which it can be sent electronically to Nissan's parts distribution centers, he said.

Most of the Nissan dealers currently look up parts numbers in either books or microfiche, Otto said.

"The real benefit may not be cost savings but increased revenue by freeing up the parts manager's time," Otto said. The Nissan system may also reduce the amount of time mechanics spend at the parts counter waiting for someone to look up parts numbers, he added.

IN BRIEF

Semi shutdown

Advanced Micro Devices, Inc. announced late last month that it will suspend operations for a four-day period following Labor Day to help balance semiconductor production levels with the prevailing weak demand. The Sunnyvale, Calif.-based firm's shutdown will affect all domestic operations except two Texas wafer fabrication locations, which produce the high-demand CMOS and programmable logic products.

. . . .

Take a debt

To streamline disk supply lines, **Miniscribe Corp.** agreed last week to acquire the secured debt of **Domain Technology, Inc.** One of the disk suppliers utilized in Miniscribe's Winchester disk drives, Domain's current status is debtor-in-possession under Chapter 11.

. . . .

Sign here, please

Unisys Corp. inked a deal late last month with value-added **Microamerica**, a microproducts distributor with more than 20,000 resellers in the U.S. Microamerica will distribute Unisys' MS-DOS-based personal computers and U series of Unix minicomputers.

. . . .

Buy the payroll

Automatic Data Processing, Inc. purchased New Jersey-based payroll-related services company **Automatic Business Centers, Inc.** (ABC) for an undisclosed sum. ABC provides payroll-related services to some 11,000 companies from 15 processing centers located primarily in the Northeast.

. . . .

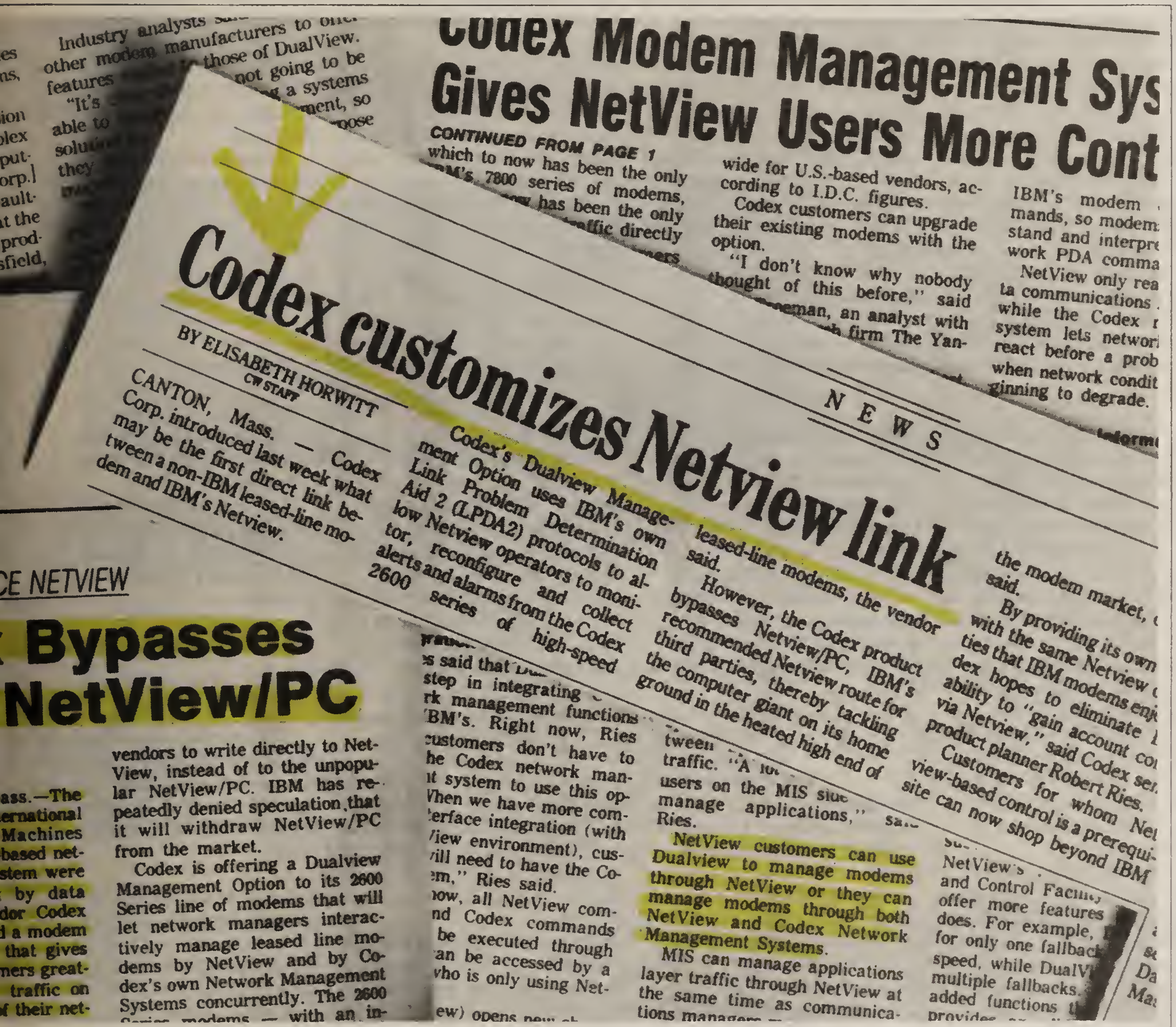
Weak hand dealt

Crosfield Electronics, Inc. parent **De La Rue Co. PLC** maintained last month that **Scitex Corp.** has not made a firm offer to buy the Glen Rock, N.J.-based Crosfield, contrary to some published reports. Instead, De La Rue is pushing for the sale to a joint venture formed by **Du Pont Co.** and **Fuji** for $370 million.

. . . .

Born to shop

In the months before it merged with **Duquesne Systems** to become **Legent Corp.** last March, Vienna, Va.-based **Morino Associates** was well on its way to Grand Acquisitor status. Now it looks like Legent got its shopping genes from Morino: The 4-month-old company last week picked up promising Westboro, Mass.-based change control software maker **Business Software Technology** in a deal valued at $47 million.



Industry analysts ... other modem manufacturers to offer ... those of DualView. ... features ... not going to be ... "It's ... a systems ... able to ... ment, so ... solu... they ...

Codex Modem Management Sys
Gives NetView Users More Cont

CONTINUED FROM PAGE 1

which to now has been the only ... 7800 series of modems, ... has been the only ... traffic directly ...

wide for U.S.-based vendors, according to I.D.C. figures.

Codex customers can upgrade their existing modems with the option.

"I don't know why nobody thought of this before," said ...eman, an analyst with ... firm The Yan-

IBM's modem ... mands, so modem ... stand and interpre... work PDA comma... NetView only rea... ta communications ... while the Codex ... system lets networ... react before a prob... when network condit... ginning to degrade.

N E W S

Codex customizes Netview link

BY ELISABETH HORWITT
CW STAFF

CANTON, Mass. — Codex Corp. introduced last week what may be the first direct link between a non-IBM leased-line modem and IBM's Netview.

Codex's Dualview Management Option uses IBM's own Link Problem Determination Aid 2 (LPDA2) protocols to allow Netview operators to monitor, reconfigure and collect alerts and alarms from the Codex 2600 series of high-speed leased-line modems, the vendor said.

However, the Codex product bypasses Netview/PC, IBM's recommended Netview route for third parties, thereby tackling the computer giant on its home ground in the heated high end of the modem market, ... said.

By providing its own ... with the same Netview ... ties that IBM modems enj... dex hopes to eliminate ... ability to "gain account co... via Netview," said Codex se... product planner Robert Ries. Customers for whom Ne... view-based control is a prerequi... site can now shop beyond IBM

...CE NETVIEW

... Bypasses NetView/PC

...ass.—The ...ernational ... Machines ...based net... ...stem were ... by data ...dor Codex ... a modem ... that gives ...ners great... traffic on ... their net-

vendors to write directly to NetView, instead of to the unpopular NetView/PC. IBM has repeatedly denied speculation that it will withdraw NetView/PC from the market.

Codex is offering a Dualview Management Option to its 2600 Series line of modems that will let network managers interactively manage leased line modems by NetView and by Codex's own Network Management Systems concurrently. The 2600 Series modems — with an in-

...s said that ... step in integrating ... rk management functions ... IBM's. Right now, Ries ... customers don't have to ... he Codex network man... it system to use this op... When we have more com... terface integration (with ... View environment), cus... will need to have the Co... em," Ries said. ... ow, all NetView com... nd Codex commands ... be executed through ... can be accessed by a ... who is only using Net... ...ew) opens new ...

...tween ... traffic. "A ... users on the MIS side ... manage applications," said Ries.

NetView customers can use Dualview to manage modems through NetView or they can manage modems through both NetView and Codex Network Management Systems.

MIS can manage applications layer traffic through NetView at the same time as communications managers ...

NetView's ... and Control Facility ... offer more features ... does. For example, ... for only one fallback ... speed, while DualV... multiple fallbacks. ... added functions ... provides ...

...View's rave reviews.

AND EVERYTHING WORKS BEST WITH A CODEX 9800 NETWORK MANAGEMENT SYSTEM.

DualView does more than let your modems talk directly with NetView. It lets you talk simultaneously to a Codex Integrated Network Management System that does a lot of things NetView can't, like predict problems and help solve them, instead of just reacting to them.

What this all adds up to is the best of everything for you: NetView to manage your SNA environment, and Codex to manage your data communications network.

CALL US FOR A DUALVIEW PREVIEW.

We invite you to give DualView your own review. For more information about how DualView can make NetView more efficient and productive, just call us toll free at 1-800-426-1212 Ext. 7235.

And find out what everybody's been raving about.

codex
MOTOROLA

IBM and NetView are trademarks of IBM.

Chips buoyant in second quarter

New wave of earnings reports finds other firms struggling for breath

BY RICHARD PASTORE
CW STAFF

The third wave of second-quarter earnings reports rolled in last week with computer industry firms such as Chips and Technologies, Inc. riding the crest, while others such as AST Research, Inc. floundered in the trough.

Chips and Technologies roared in with a 43% revenue gain and a 60% net income rise over 1988 second-quarter levels. The company posted quarterly revenue of $61.8 million and net profit of $10.1 million. President Gordon Campbell said the sales growth reflected strong acceptance of the company's Chipset products in the IBM Personal Computer AT-compatible market.

Image processing helped boost **Filenet Corp.'s** quarterly sales 23% over the like quarter last year to $20.4 million, according to Chief Executive Officer Ted Smith. The firm's net income, however, remained flat at $1.6 million — also the profit posted for second quarter last year.

A spring-quarter turnaround at **Relational Technology, Inc.** overshadowed a winter-quarter loss, as the relational database management systems vendor posted profits of $4.5 million for the quarter and $6.2 million for the year. While the annual profit was off 17% from a year earlier, quarterly profit was up 26% from the comparable quarter a year ago, and revenue climbed 56% to $47.2 million.

Xerox Corp. coasted in with 8% revenue gains and a 7% rise in net income over the same quarter last year. Revenue totaled $4.4 billion, and net income added up to $179 million. Revenue from Xerox's business products and systems was also up 8% in this quarter; it would have been 11% if not for the negative effects of foreign currency translations, the company said.

Companies that seem to have clambered up from the murky depths of net losses and broken the surface of profitability include **Alliant Computer Systems Corp.** and **EMC Corp.**

Alliant reported a net income of $377,000, up from a net loss of $8.6 million in the corresponding period of 1988. Revenue was $17 million, a 19% rise over last year's level. The company attributed the change in fortunes to expansion of worldwide direct sales and service channels and the acquisition of Raster Technologies, Inc.

EMC recorded a net income of $128,000, compared with a loss of $3.4 million in the same period last year. Revenue, in the meantime, grew 15% to $34.6 million. EMC Chairman Richard Egan credited the comeback to the domestic sales force's refocusing on traditional storage products.

AST Research was one of the trough dwellers — it staggered in with revenue down 9% and net income off 68% from last year's comparable quarter. The company's $123.5 million revenue and $2.5 million net income for the quarter were not enough to save it from a net loss of $7.5 million for the 1989 fiscal year ended July 1.

Data Switch Corp. suffered an 83% drop in net income growth from 1988's second quarter, posting a profit of $175,000. Revenue of $28.6 million was also down 3% from last year's level. The company cited planned expensing of previously deferred development costs and commercial pricing pressure as reasons for the downturn.

Reduced demand from major OEM customer **Unisys Corp.** accounted for **Arix Corp.'s** 23% decline in revenue and 50% drop in net income from the levels achieved in 1988's corresponding quarter, the company said. Arix logged in with $20.1 million in revenue and $1.2 million in net income.

1989 second-quarter earnings

Third wave of reports packs heavy profit undertow

	Revenue April through June (in millions)	Percent change from 1988	Net income April through June (in millions)	Percent change from 1988
Alliant	$17	19%	$0.38	---
Arix	$20.1	(23%)*	$1.2	(50%)
AST Research	$123.5	(9%)	$2.5	(68%)
Chips and Technologies	$61.8	43%	$10.1	60%
Data Switch	$28.6	(3%)	$0.18	(83%)
EMC	$34.6	15%	$0.13	---
Filenet	$20.4	23%	$1.6	0
Xerox	$4.4B	8%	$179	7%

* Parentheses indicate decrease

CW CHART

Rifkin

FROM PAGE 77

Bedford, Lowell, Westboro, Natick, Westwood and other towns that dot the Rt. 128 to Rt.495 landscape, the technology dream is being shaken, twisted and turned upside down.

The news is bad; Governor Dukakis' Massachusetts Miracle has transformed into a bright, shining lie, and at the heart of the disaster is a continued litany of trouble in the technology sector. Wang is burning, Prime is aimless, Data General is wallowing, and even DEC, the region's largest employer, just announced a major drop in profits. Apollo and Cullinet, once two of the brightest stars, are swallowed up and gone.

The personalities whose faces hovered proudly over the highway now seem gray, wrinkled and tired. Where is the proud arrogance of John Cullinane, the rebellious intensity of Edson de Castro, the unstoppable innovation of Bill Poduska, the irrefutable charm of Ken Olsen? Dr. An Wang is recovering from double surgery, once on the morning of his operation by a tasteless, though depressingly accurate *Wall Street Journal* article, and later to remove a cancerous tumor.

In the space of a year, the region went into a tailspin. What was once the proud home of potential President Dukakis is now chaotic. Dukakis dove from the doorstep of the White House to the outhouse in his home state. The word locally is that he couldn't get elected dog catcher in Brookline right now. But the ripples go further. With high-tech down, the tax base is hurting, services are being cut faster than a green June lawn, and layoffs and uncertainty are turning the economy stagnant.

Alex Beam, a business columnist for the *Boston Globe*, pointed out recently that venture capital for high tech is drying up in the region. First-round financing for start-ups in the computer industry dipped from 20 in 1987 to 11 in 1988, while similar financing in the Silicon Valley rose from 59 to 62, Beam wrote.

He added that perhaps MIT, long a bastion of entrepreneurial spirit, has been supplanted by Stanford as the father of high-tech babies.

It is, of course, easier to find scapegoats than solutions when things turn sour. No one can pinpoint the exact causes of the dips and turns of our industry. Are Rt. 128's woes long term or just a momentary blip? Has the leading edge of technology moved west for good? I doubt it. Folk heroes like Mitch Kapor, Daniel Bricklin and Danny Hillis are alive and kicking.

And to my knowledge, MIT hasn't closed its doors, nor has Harvard or Brandeis or Boston University. So the next generation is out there in the coffee shops of Kendall Square plotting the future even now.

The big players in the region all had the misfortune of getting caught flat-footed in a race to change. Companies such as Wang and Data General will unlikely see the glory days of the past, a fact they are currently unconcerned with as they fight for survival. But remember that these are billion-dollar companies with large installed bases and loyal customers. As they awkwardly learn steps to a new dance, there is still hope, however bleak it seems in the face of disastrous quarterly earnings and layoffs.

The bigger question for Rt. 128 is one of the spirit of perseverance. Will the bright minds and brazen egos that built the region abandon the spirit that brought the prominence? Will they take a look at the traffic and congestion and decide to pack it in? Or will they find some convenient off ramp, search out some alternative back road and find the glitter once again?

The information industry isn't going to get smaller in the coming decade, and Rt. 128 still looms as a major highway on the map.

Rifkin is a *Computerworld* features editor.

EXECUTIVE CORNER

Herndon, Va.-based systems integration company C3, Inc. announced the election of **Fred Knoll** as chairman of its board of directors. Knoll, a director of C3 since May 1989, is chairman of Knoll Management L.P.

Cleveland-based LDI Corp. named new presidents of its two largest sales and leasing companies. Former Cullinet Software, Inc. district sales manager **Michael T. Joseph** has become president of Leasing Dynamics, Inc., and **Frank G. Skedel** is now president of LDI Financial Services Corp.

Leasing Dynamics and LDI Financial Services are comparably sized companies and account for more than 85% of LDI Corp.'s $445 million in assets.

The two firms contribute a similar proportion to consolidated revenues and operating income.

Michael Upp is the new chief operating officer of personal computer document image processing products maker Xionics, Inc. Upp will be spearheading the company's aggressive expansion into the document image processing market, which is estimated at $1 billion.

William W. Neal has joined the Charlotte, N.C.-based computer systems and services firm of Broadway & Seymour, Inc. as president and chief executive officer.

Neal comes to Broadway & Seymour from Welsh, Carson, Anderson & Stowe, a New York investment and venture capital firm with investments concentrated in the computer and health care industries.

"Bill has been instrumental in establishing the strategic direction which we are currently implementing," commented Chairman Olin Broadway.

Don H. Davis Jr., senior vice-president and general manager of the Industrial Computer Communication Group of Allen-Bradley Co., has been named president of the company, succeeding **J. Tracy O'Rourke**.

O'Rourke has been elected as one of the three new executive vice-presidents and chief operating officers of Allen-Bradley's parent, Rockwell International Corp.

John G. Mates, formerly managing director, has been promoted to president of Wang Credit Corp., a wholly owned subsidiary of Wang Laboratories, Inc.

In this position, Mates is directly responsible for the total operations of Wang Credit, including sales, marketing, credit, collections, operations and accounting.

Ft. Lauderdale, Fla.-based communications company Telematics International, Inc. announced that **William A. Hightower** has been named president, chief operating officer and a member of its board of directors.

Prior to joining Telematics, Hightower was vice-chairman and chief executive officer of American Transtech, a subsidiary of AT&T in Jacksonville, Fla., and chairman of AT&T's advanced information services in Boston.

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20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
80. Government — State/Federal/Local
65. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/Refining/Agric
60. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
90. Computer/Peripheral Dealer/Distributor/Retailer
75. User Other ______
95. Vendor Other ______ (Please specify)

2. **TITLE/FUNCTION** (Circle one)

IS/MIS/DP MANAGEMENT
19. Vice President, Asst. VP
21. Dir., Mgr., Suprv., IS/MIS/DP Services
22. Dir., Mgr., Suprv., of Operations, Planning, Adm. Services
23. Dir., Mgr., Suprv., Analyst, of Systems
31. Dir., Mgr., Suprv., of Programming
32. Programmer, Methods Analyst
35. Dir., Mgr., Suprv., OA/WP
38. Data Comm, Network/Systems Mgt

OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Mgr
12. Vice President/Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt
51. Sales/Mktg. Mgt

OTHER PROFESSIONALS
60. Consulting Mgt
70. Medical, Legal, Accounting Mgt
80. Educators, Journalists, Librarians, Students
90. Others ______ (Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant
A. Mainframes/Superminis
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Office Automation Systems
F. No Computer Involvement

E4932-0

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20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
80. Government — State/Federal/Local
65. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/Refining/Agric
60. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
90. Computer/Peripheral Dealer/Distributor/Retailer
75. User Other ______
95. Vendor Other ______ (Please specify)

2. **TITLE/FUNCTION** (Circle one)

IS/MIS/DP MANAGEMENT
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31. Dir., Mgr., Suprv., of Programming
32. Programmer, Methods Analyst
35. Dir., Mgr., Suprv., OA/WP
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12. Vice President/Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt
51. Sales/Mktg. Mgt

OTHER PROFESSIONALS
60. Consulting Mgt
70. Medical, Legal, Accounting Mgt
80. Educators, Journalists, Librarians, Students
90. Others ______ (Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant
A. Mainframes/Superminis
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Office Automation Systems
F. No Computer Involvement

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When your parachute is golden

Have a sound game plan ready when you are offered an early retirement

BY JERRY KANTER
SPECIAL TO CW

You are a 57-year-old systems development manager whose career in middle management has reached a plateau at the company where you have worked for 26 years.

Your job is not exciting or in the mainstream of the company's power curve, but it is comfortable. It is a nice place to spend the hours between breakfast and dinner. It is a safe bet that you can contentedly roll along until age 65.

Then the company is taken over. The heat is on to lower costs, and you are among the middle managers offered an early retirement package. It is a typical situation today, stemming from the demographics of a middle-aged work force that was educated in the restrained, establishment-oriented 1950s.

When the golden parachute is offered, look at the package selfishly; your company does. To them, it is a numbers game — and you are one of the numbers. I base my point of view not only on what I have observed but also on a study I conducted as well as my own experience in accepting an early retirement package from Honeywell Information Systems in 1987.

You first must fight the inertia and conservatism that a quarter of a century at the same company has built up. You can hang on and accept a quiet erosion of respect from management and peers, or you can use the golden parachute to land elsewhere while there is still time.

It becomes a question of risk, and risk is a stranger to those who have spent their lives in middle-management America. Lethargy and aversion to risk are the hallmarks of work within a bureaucracy. It is hard to pinpoint responsibility for actions that are decisions of a network of committees and review processes. However, there may be greater risk in staying with an organization that says the retirement package is voluntary but really wants you to leave.

The age of acquiring us

With the merger age upon us, there will be a significant increase in the number of voluntary and forced retirements. To make such an event an opportunity rather than a crisis requires personal planning.

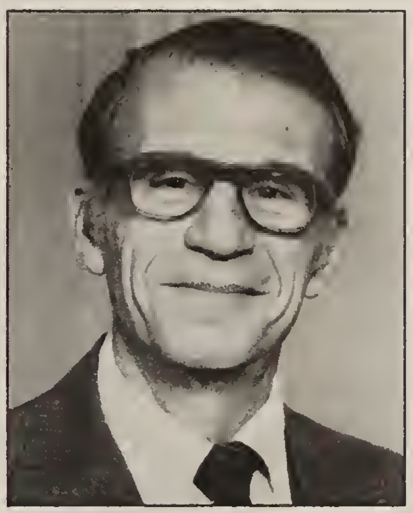
There is no question that the standard business manager spends time planning for work. He may also plan car maintenance, house painting and management of other assets, but he probably puts precious little time into planning his own career. Thus, careers often develop through serendipity.

During the last five years, I began to develop and use planning techniques as part of my professional life. The critical success factors (CSF) methodology provides a simple but effective framework for developing a personal planning strategy. Simply stated, you determine objectives, or end points, that define success for you. Next, you develop a set of CSFs — those six to eight accomplishments that, if properly performed, will let you reach your objectives.

I determined that my ultimate goals were not wrapped up in fame or fortune but in doing meaningful work in the public sector — probably a not-for-profit institution — that would take advantage of my professional information systems skills. I knew I would have to leave the business world within five years because I was running out corporate enthusiasm; if it didn't show yet, it would before long.

My objective became securing a position with a college or university at which I would be able to teach and/or run some type of adjunct IS program while simultaneously finding time to consult and continue my volunteer work in the community.

With these objectives, what were the CSFs — the actions necessary to reach the objectives? Given the "publish or perish" syndrome of the academic world, I decided to publish three articles in the next year. Next, I felt that teaching and lecturing were important and decided to develop several education and training sessions. The third action was to begin personal networking, both in the academic arena and for potential consulting contacts.


Babson's Kanter *advocates CSFs for career planning*

I was fortunate because these activities were generally consistent with what I was doing for the company. If they were not, however, I think I would have tried to move into an area that would meld with my CSFs or somehow carve out time to pursue them. Using this approach was instrumental in taking advantage of the golden parachute that I accepted in 1987.

Another valuable technique for career planning is to develop and regularly update your resume. Putting down your career objectives and stating your experience and background is an excellent exercise. Keep a career file containing your CSFs and resume along with other important material such as names of potential contacts, relevant articles and notes on second careers.

No loitering

Though it is difficult to do, act as if you had to make a career move next week. You are not being disloyal to your company, for if management wants numbers to meet its retirement quota, it will welcome people who are prepared to sign up. To paraphrase a popular commercial: "Your resume and CSFs: Don't leave home without them."

If your own situation starts to resemble the ones I have described, the message is that it is time to do something about it. Do a little personal planning; jot down your objectives and the critical success factors that will assist you in attaining those objectives. Do not wait until you are offered a golden parachute, because it will be too late. Without a plan, there is panic, and panic may lead you to sit it out and stay with the company — and that could be the worst decision of all.

Kanter is executive director of the Center for Information Management Studies at Babson College in Wellesley, Mass.

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UNISYS

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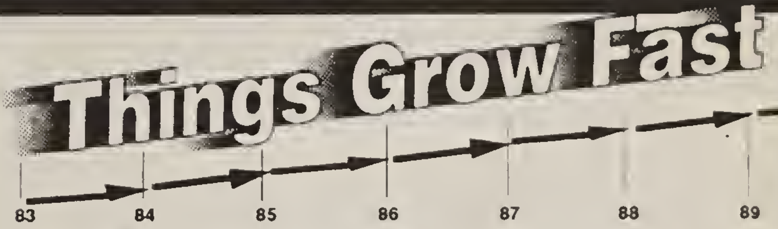

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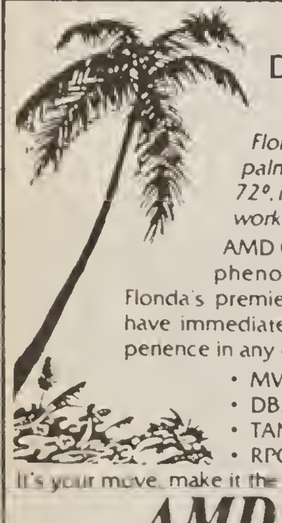

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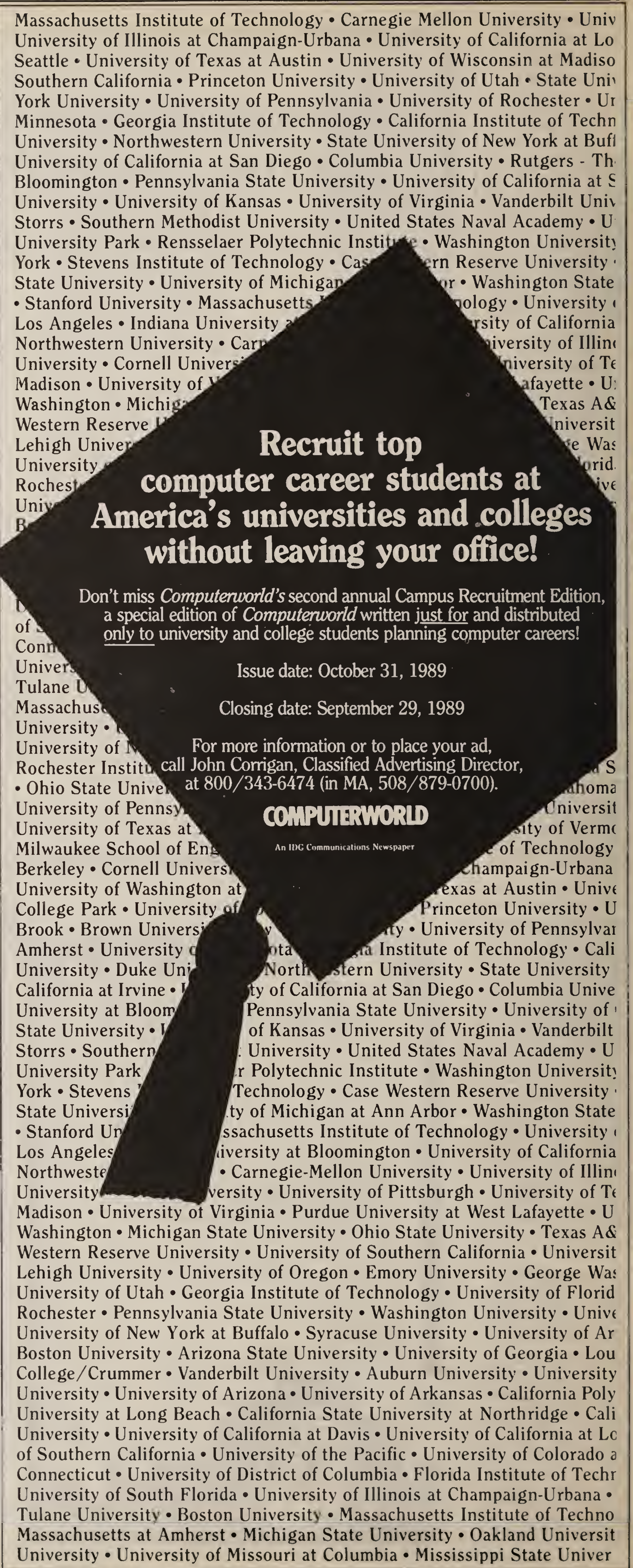
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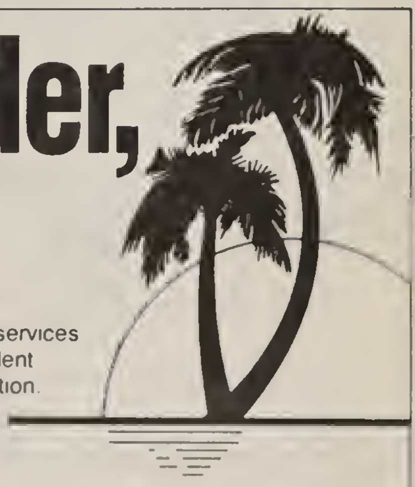

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Planned Editorial Features:

(subject to revision)

- MIS salary and job satisfaction survey
- Where are the best jobs?/What positions are hot?
- Experiences of recent MIS graduates in their first jobs and what helped them in school
- The MIS career ladder
- Profiles of acclaimed top level MIS executives
- The strategic advantage of computers and how they play a key role in running a company

MARKETPLACE

Traps to avoid when leasing

Well-worded contracts eliminate unwelcome surprises down the road

BY MICHAEL ERBSCHLOE
SPECIAL TO CW

Are you about to lease a computer? Are you sure you know all the terms of the lease? Do you understand all of your potential costs? Leasing can cost more than you expected if you fail to carefully negotiate the terms.

A standard lease covers the responsibilities of each party for commencement, renewal and termination as well as ongoing responsibilities such as payment of rent, taxes and maintenance. However, computer leases can be full of surprises.

For example, lessors usually will not guarantee how the computer will function or perform; whether it will be compatible with existing hardware or software; its reliability; the terms for acceptance; or whether the manufacturer will maintain the machine. For the lessor to provide such assurances, you must have them written into the lease agreement.

Since a lessor may assign its rights and obligations under the lease to another party, it is important that all verbal commitments be formalized in writing in a master agreement.

Delivery dates for new and used equipment are critical. When there are several components to install, you need a written guarantee that everything will arrive in a timely manner.

In any lease transaction, you should ensure that your liabilities are specifically limited to situations under your control — that is, when the computer is in your possession and being used by you and maintained under your supervision.

Insist on the legal right of "quiet enjoyment," ensuring that as long as you follow the lease obligations, no party can repossess or interfere in any way with your use of the equipment.

Insist on being able to verify the seller's name, that the equipment has been legally exchanged and that the title has been transferred to the lessor before the lease commences.

Be sure that rental payments are based on the lessor's actual acquisition costs. In the event of a price change by the manufacturer prior to the date of closing, see that you are not overcharged.

The options you can exercise during renewal periods are critical, especially those that apply to the lessor going bankrupt or out of business.

An organization leasing a computer almost always pays more to renew the agreement than does an organization entering into a new lease with the same terms. This is because the lessor has an advantage in the case of the renewal: It will gamble that the lessee does not want to make the investment required to install another computer and perform conversions. In addition, most leases are worded to prevent you from canceling or changing a notice that you intend to let a lease expire without renewing it.

> IN ANY LEASE transaction, you should ensure that your liabilities are specifically limited to situations under your control.

To avoid unnecessary last-minute contract concessions, you should prenegotiate a master lease agreement with several lessors before negotiating a specific transaction. Always consult your attorney before issuing an award letter, soliciting bids or accepting proposals.

The prenegotiated minimum renewal term should be consistent with your expected needs. For example, if you have an initial lease of 24 months, you may want to negotiate a right to renew for an additional 12 months at either the same rental rate in the original contract or at a reduced amount.

It is possible to terminate your lease before the negotiated end date, but you may face extra charges. Options for early termination include the following:

- **Sublease.** Although the right to sublease is often assumed, the lessor is not obligated to offer you the option. This gives the lessor control over remarketing the equipment and allows him to fix and manipulate terms to his satisfaction.

You should always insist on the option to sublease; it is the primary means you have to maintain control over sublease negotiations prior to the lease's expiration.

- **Retroactive rental.** Upon termination, the rental amount is retroactively increased to the start of the lease, and the increase is paid in a lump-sum penalty. The lessor will refer to it as a termination charge.
- **Stipulated termination amount.** Your lease should include a table of payments you can make to relieve you of all further obligations after you return the equipment to the lessor.
- **Purchase option.** Your lease may provide an option to purchase the equipment prior to the normal lease termination date.
- **Walkaway.** You deliver notice of termination, and the lease obligation is discontinued. However, the lessor may tie other equipment into this right of termination, thus precluding you from relinquishing one machine while retaining the rest.

When giving notice of termination, be sure that the timing is to your advantage and that removal of the equipment will not disrupt your operations. It is unlikely the equipment actually will be removed on the date specified in the termination notice, so you should insist on the option of postponing the removal date — several times if needed. Also, watch out for last-minute charges the lessor may try to impose at this time.

Erbschloe is a managing editor at Computer Economics, Inc. in Carlsbad, Calif.

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The BoCoEx index on used computers

Closing prices report for the week ending July 28, 1989

	Closing price	Recent high	Recent low
IBM PC Model 076	$475	$625	$400
XT Model 086	$800	$1,150	$700
XT Model 089	$1,125	$1,400	$950
AT Model 099	$1,600	$1,850	$1,500
AT Model 239	$1,775	$2,100	$1,700
AT Model 339	$1,850	$2,000	$1,700
PS/2 Model 50	$1,750	$2,000	$1,700
PS/2 Model 60	$3,200	$3,300	$2,500
Compaq Portable I	$475	$750	$325
Portable II	$1,700	$2,100	$1,700
Portable III	$2,875	$2,950	$2,200
Portable 286	$1,850	$2,000	$1,675
Plus	$900	$1,200	$900
Deskpro 286	$1,950	$2,350	$1,700
Deskpro 386	$2,750	$2,900	$2,500
Apple Macintosh 512	$600	$650	$300
512E	$700	$925	$600
Plus	$900	$1,150	$750
II	$3,425	$4,175	$2,825
Toshiba T-3200	$2,650	$3,000	$2,475
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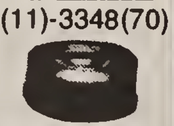

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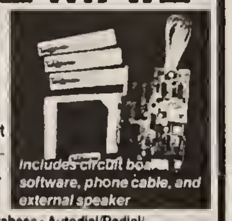

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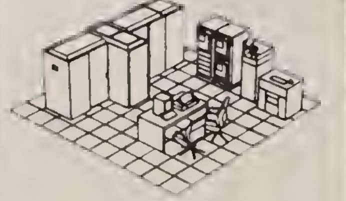

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5. The Vendor's overall responsiveness to the requirements and requests of the RFP.

6. Total cost of the proposed system.

The Authority, at its option, may enter into negotiations with one or more proposers as provided for in the Information for Proposers section of the Contract Documents. Copies of such documents may be secured from Ms. Angie Phifer, Secretary, Metropolitan Transportation Authority, 347 Madison Avenue, New York, NY 10017.

RFP	DATE	TIME
6-01-89385-0	8/28/89	3PM

FOR: "Service Bureau/Time Sharing Services to Provide An integrated Payroll/Resources System for both MTA and TBTA

Washington County, Oregon Request for Proposals (No. 90007P)

Notice is hereby given that Washington County, Oregon is requesting proposals from qualified organizations to provide data processing services to include any or all of the following services: data center operations, application development and/or acquisition support, personal computer support, planning, and management.

A pre-proposal conference will be held et 2:00 P.M., Wednesday, August 16, 1989 in Room 402, Washington County Administretion Building, 150 North First Avenue, Hillsboro, Oregon.

Proposals must be received by 2:00 P.M., Friday, September 15, 1989 in the Purchasing Office, Washington County, 434 South First Avenue, Suite 200, Hillsboro, Oregon 97123. Proposals received efter the designated time and date will be returned unopened.

The County may reject any proposal not in compliance with all prescribed public bidding procedures and requirements, and may reject for good cause any or ell proposals upon finding of the County it is in the public interest to do so.

Copies of the Request for Proposals document are evailable by calling Avelina Gulmatico, (503) 648-8603.

The Washington County Board of County Commissioners reserves the right to reject any and all proposals and to waive any and all informalities in the best interest of the County.

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Quiz yourself on effectiveness

Pondering these questions can bolster training — and your career, too

BY ROBERT B. WARE
SPECIAL TO CW

At conferences, I often ask training managers and trainers a few questions to set the tone for the session I conduct. The results can provide insights to their attitudes toward training and outline the steps they might take to become more effective.

The question I start with is, what business are you in?

About 45% of the people list their company or organization as their business, but the other 55% list training. The responses suggest that the majority may not see their role as directly promoting the business interests of their organization. I infer that they view training as an end in itself rather than as an instrument to provide skills that allow their companies to achieve organizational goals.

This attitude can result in training that is unfocused, which in turn can mean that the wrong people are trained or employees are trained at an inappropriate time or in skills that they will not use. The end result can be a waste of money and other resources, high frustration and frequent staff turnover.

Next, I ask the training managers and trainers to rank the following problems in order of importance:

- Downsizing staff functions.
- Elimination of training jobs through corporate mergers.
- Career dead ends.
- Vulnerability of training budgets to corporate financial health.
- Lack of management commitment to approved training plans.
- Lack of skills planning by information systems management.

Commitment problems

Not surprisingly, the most frequently expressed concern is the fifth — lack of management commitment. A crucial issue for training managers and trainers thus becomes, how does the training department win management commitment?

I'd like to suggest three additional questions that might help shed some light on this issue.

- For those of you who make regular reports to your manager, what are the contents or major headings of fields for such reports?

The training organization should generate a regular report that illustrates to management what progress it is making toward the achievement of a previously agreed-upon plan. The plan should be linked strategically to skills required for the major IS projects planned or under way.

> THE TRAINING MANAGER must align his or her efforts with the achievement of the goals of the managers within the organization, and this alignment must be apparent to others.

The report, perhaps issued quarterly, should spell out who is to be trained, what skills are required of them and when the skills are to be acquired. This regular consultation between the training manager and his superior can help assure that goals are being met and that necessary revisions to the plan are made and implemented in a timely manner.

Furthermore, this procedure will help ensure that the training manager is associated with the transfer of skills that directly contribute to the achievement of high-visibility IS projects, an association that ultimately will be to the training manager's long-term benefit. In the process, it becomes increasingly difficult for IS management to cut training budgets.

- What do you expect will be the major topics of conversation when your top computer executive has his annual performance review or when your immediate manager has his review?

These questions help focus training on those activities that make management — and ultimately the company — look good. Answering them can generate insights on how to apply one's efforts when there is a clear understanding of what counts most to management.

Imagining the topics of management performance reviews is a shorthand method of dealing with the planning methodology known as critical success factors. The training manager must align his or her efforts with the achievement of the goals of the managers within the organization, and this alignment must be apparent to others. The training manager can tie the various goals together by noting their relationships to overall corporate objectives.

- List the IS management concerns or problems in your IS department that in any way involve IS professionals. You may wish to include, among others, project backlogs, late delivery of projects, systems that fail to satisfy user management, professional productivity, high employee turnover or finding enough properly qualified professionals.

This question is intended as a checklist for some of the common problems facing top computer executives. It behooves the training manager to concentrate on the issues that have the highest priority in his organization.

Ware is chairman of Ware Associates, a division of W/A, Inc. in Groton, Conn.

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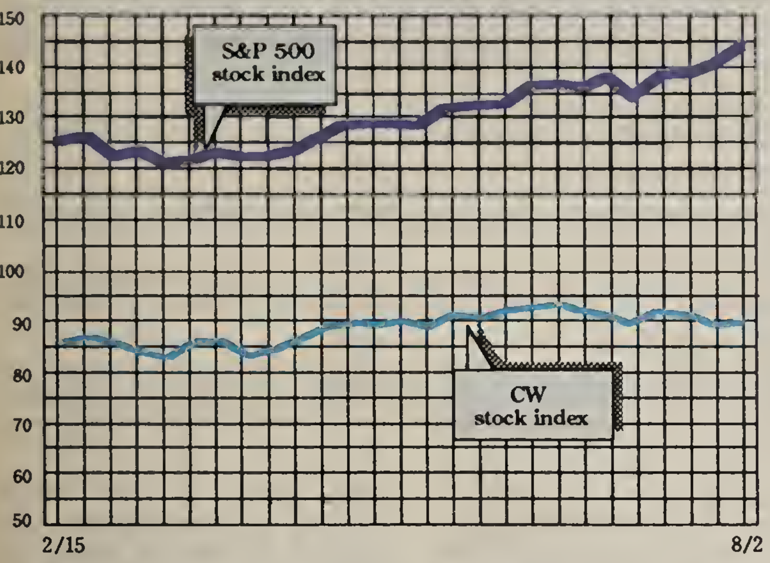

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Semiconductors	55.2	**55.4**
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Leasing Companies	119.9	**119.2**
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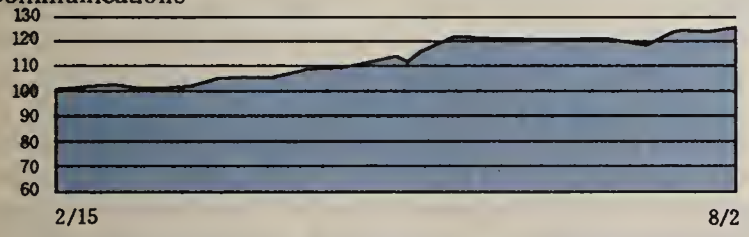
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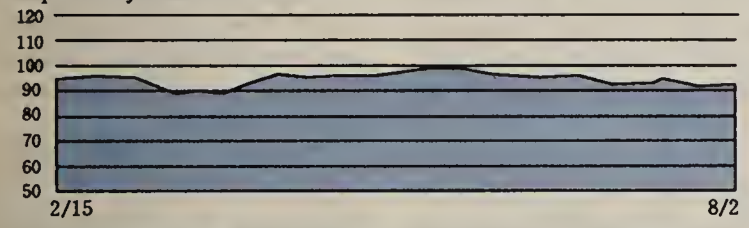
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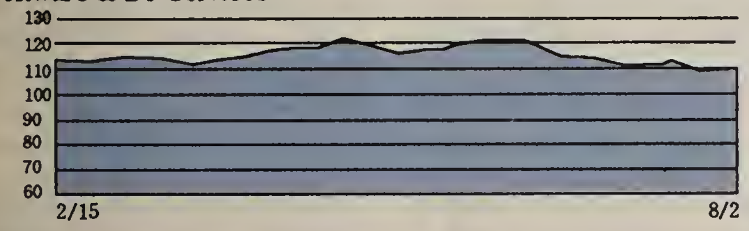
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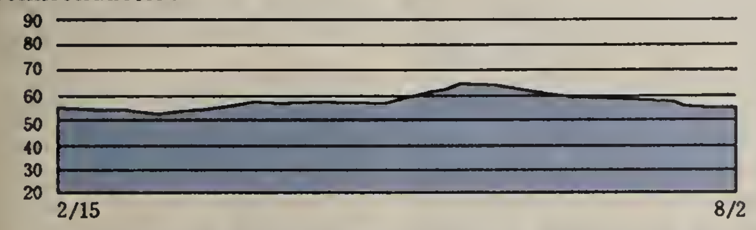
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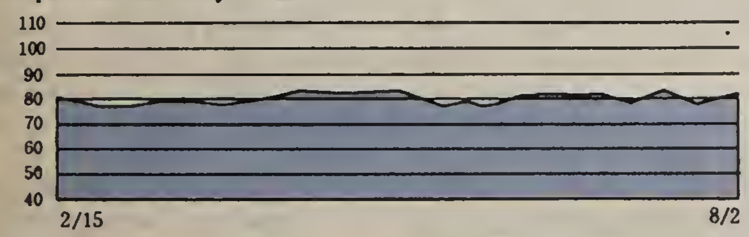
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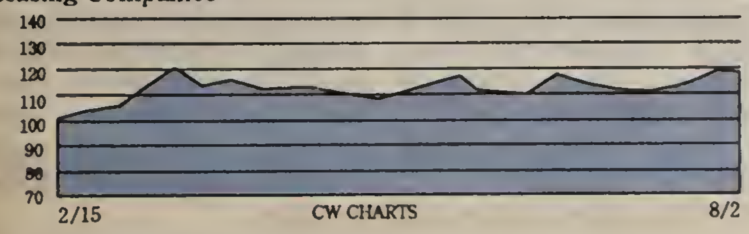
Leasing Companies

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, AUG. 2, 1989

Communications and Network Services

EXCH		PRICE				
		52-WEEK RANGE		CLOSE AUG. 2, 1989	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN INFO TECHS CORP	63	44	62	3.3	5.5
Q	ANDREW CORP	26	16	23.75	-1.5	-5.9
Q	ARTEL COMM CORP	8	2	7	0.4	5.7
N	AT&T	61	24	40.125	0.8	1.9
Q	AVANTEK INC	7	4	5.625	-0.1	-2.2
N	AYOIN CORP	19	13	17.25	-0.1	-0.7
N	8ELL ATLANTIC CORP	99	68	96.625	4.5	4.9
N	8ELLSOUTH CORP	54	39	52.875	2.5	5.0
Q	COMPRESSION LABS INC	9	3	8.125	-0.8	-8.5
Q	COMPUTER NETWORK TECH	3	1	2.688	0.0	0.0
Q	CONTEL CORP	66	34	62.75	2.1	3.5
Q	DATA SWITCH CORP	7	4	4.125	0.1	3.1
Q	OIGITAL COMM ASSOC	32	17	21.125	0.3	1.2
Q	DYNATECH CORP	22	17	17.25	0.0	0.0
Q	FI8RONICS INTERNATIONAL INC	7	3	7.25	0.5	7.4
Q	GANDALF TECHNOLOGIES	7	4	6.125	0.5	8.9
N	GENERAL DATACOMM INOS	6	3	4.875	-0.4	-7.1
N	GTE CORP	60	40	59.75	1.9	3.2
Q	INFOTRON SYS CORP	13	10	10.25	-0.3	-2.4
N	ITT CORP	63	46	61.375	-0.9	-1.4
N	M A COM INC	11	7	7.5	-0.3	-3.2
Q	MCI COMMUNICATIONS CORP	42	16	38.375	0.3	0.7
N	NETWORK EQUIP TECH INC	25	14	24	2.6	12.3
Q	NETWORK SYS CORP	12	8	8.875	-0.1	-1.4
N	NORTHERN TELECOM LTD	21	14	19.875	-0.5	-2.5
Q	NOVELL INC	38	24	28.125	1.1	4.2
N	NYNEX CORP	84	63	79.375	3.4	4.4
N	PACIFIC TELESIS GROUP	45	28	44.375	2.0	4.7
A	PENRIL CORP	6	3	5.625	0.1	2.3
N	PLESSEY PLC	46	25	45	1.3	2.9
N	SCIENTIFIC ATLANTA INC	21	10	19	-0.5	-2.6
N	SOUTHWESTERN 8ELL CORP	58	36	57.125	2.4	4.3
Q	3 COM CORP	29	16	17	0.4	2.3
N	U S WEST INC	74	53	73.5	3.6	5.2

Computer Systems

Q	ALLIANT COMPUTER SYS	6	3	4.75	0.1	2.7
Q	ALPHA MICROSYSTEMS	8	5	7.125	-0.3	-3.4
Q	ALTOS COMPUTER SYS	10	6	5.875	0.0	0.0
A	AMDAHL CORP	24	14	14.5	-0.5	-3.3
Q	APPLE COMPUTER INC	50	34	40.5	2.3	5.9
N	8OLT 8ERANEK & NEWMAN	18	7	7.5	0.1	1.7
N	COMPAQ COMPUTER CORP	102	50	89	2.1	2.4
N	COMMODORE INTERNATIONAL	20	9	10.5	0.3	2.4
Q	COMPUTER AUTOMATION INC	7	3	2.875	-0.8	-20.7
N	CONTROL DATA CORP	24	16	20.375	-1.3	-5.8
Q	CONVEX COMPUTER CORP	15	7	14.25	0.4	2.7
N	CRAY RESH INC	83	41	44.125	2.1	5.1
Q	DAISY SYS CORP	9	3	4.25	1.0	30.8
N	DATA GEN CORP	21	14	17	0.0	0.0
N	DATAPOINT CORP	6	3	5.125	-0.1	-2.4
Q	DELL COMPUTER CORP	13	6	6.875	-0.3	-3.5
N	OIGITAL EQUIP CORP	122	86	93.75	2.3	2.5
N	FLOATING POINT SYS INC	4	2	2.5	0.0	0.0
N	HARRIS CORP	35	25	34.5	-0.4	-1.1
N	HEWLETT PACKARO CO	62	44	52.75	0.6	1.2
N	HONEYWELL INC	90	57	89.875	2.5	2.9
N	I8M	131	106	114	1.5	1.3
Q	INFORMATION INTL INC	16	13	15.25	0.0	0.0
Q	IPL SYS INC	9	2	7.625	-0.4	-4.7
N	MAI 8ASIC FOUR INC	20	5	5	-0.4	-7.0
N	MATSUSHITA ELEC INDL LTD	213	158	171.875	6.8	4.1
Q	MENTOR GRAPHICS CORP	45	23	34.5	1.3	3.8
N	N8I INC	4	1	2	-0.3	-11.1
N	NCR CORP	62	51	59.75	0.0	0.0
N	PRIME COMPUTER INC	21	12	17.125	1.4	8.7
Q	PYRAMID TECHNOLOGY	20	9	12	0.0	0.0
Q	SHARE8ASE CORP	4	2	2.313	0.0	0.0
Q	SILICON GRAPHICS CORP	21	14	18.875	1.4	7.9
Q	STRATUS COMPUTER	35	21	28.75	0.3	0.9
Q	SUN MICROSYSTEM INC	23	13	13.625	-2.0	-12.8
Q	SYM8OLICS INC	3	1	1.75	0.1	7.7
Q	SEQUENT COMPUTER SYS INC	28	14	26.375	-0.3	-0.9
N	TANOEM COMPUTERS INC	21	12	20.375	0.6	3.2
N	TANOY CORP	47	38	45.625	1.5	3.4
N	ULTIMATE CORP	13	7	8.25	-0.3	-2.9
N	UNISYS CORP	36	20	21.875	1.1	5.4
A	WANG LA8S INC	11	6	5.75	-0.6	-9.8

Software & DP Services

Q	ADVANCEO COMP TECH	4	1	1	0.1	6.6
Q	AMERICAN MGMT SYS INC	19	11	12.875	1.3	10.8
Q	AMERICAN SOFTWARE INC	18	9	15.625	1.4	9.6
N	ANACOMP INC	10	5	6	0.8	14.3
Q	ANALYSTS INTL CORP	22	8	21.25	0.3	1.2
Q	ASHTON TATE	28	14	15.25	0.3	1.7
Q	ASK COMPUTER SYS INC	18	12	12.5	-1.6	-11.5
Q	AUTODESK INC	40	23	36.75	1.8	5.0
N	AUTO DATA PROCESSING	42	35	41	0.5	1.2
Q	8MC SOFTWARE INC	24	8	21.625	-0.1	-0.6
Q	8OOLE & BA8BAGE INC	20	9	13.5	-2.1	-13.6
N	8USINESSLAND INC	15	10	11.375	-0.4	-3.2
N	COMPUTER ASSOC INTL INC	22	12	18	0.0	0.0
Q	COMPUTER HORIZONS CORP	12	7	7.5	-0.5	-6.3
N	COMPUTER SCIENCES CORP	56	44	52.25	-2.1	-3.9
Q	CORPORATE SOFTWARE	16	9	12.75	1.0	8.5
N	COMPUTER TASK GROUP INC	17	11	13.75	0.9	6.8
Q	COGNOS INC	9	5	6.125	0.0	0.0
Q	COMSHARE INC	35	18	30.75	-2.1	-6.5
N	CULLINET SOFTWARE INC	9	4	8.5	-0.1	-1.4
N	GENERAL MTRS (CLS E)	54	39	52.75	0.3	0.5
Q	HOGAN SYS INC	7	4	5.625	-0.5	-8.2
Q	INFORMIX CORP	13	7	8.5	-0.6	-6.8
Q	INTELLICORP INC	5	2	4.25	0.6	17.2
Q	KEANE INC	19	7	16	1.8	12.3
Q	LEGENT CORP	30	16	29.125	-0.9	-2.9
Q	LOTUS DEV CORP	27	15	26	2.5	10.6
Q	MANAGEMENT SCI AMER	12	6	11.125	0.8	7.2
Q	WORDSTAR	4	2	2.125	0.0	0.0
Q	MICROSOFT CORP	65	45	54.25	1.5	2.8
Q	NATIONAL DATA CORP	34	19	32	-1.1	-3.4
N	ON LINE SOFTWARE INTL INC	7	4	5.75	-0.3	-4.2
Q	ORACLE SYS CORP	17	7	15.375	-0.5	-3.1
N	PANSOPHIC SYS INC	18	12	12.375	-0.5	-3.9
Q	PHOENIX TECHNOLOGIES INC	19	5	5	-1.0	-16.7
Q	POLICY MGMT SYS CORP	35	21	33	1.5	4.8
Q	PROGRAMMING & SYS INC	20	12	18.625	-0.6	-3.2
Q	RAB8IT SOFTWARE INC	3	1	1	-0.1	-5.9
Q	RELATIONAL TECHNOLOGY INC	20	9	9.25	-0.9	-8.6
N	REYNOLDS & REYNOLDS CO	34	18	25.75	0.4	1.5
Q	SEI CORP	20	16	18.625	0.1	0.7
Q	SHAREO MEO SYS CORP	20	14	15.25	-0.9	-5.4
Q	SAGE SOFTWARE INC	10	6	7.75	0.3	3.3
Q	SOFTWARE PUBG CORP	29	16	20.75	-0.4	-1.8
A	STERLING SOFTWARE INC	8	5	7.25	0.5	7.4
Q	SUNGARO DATA SYS INC	20	13	17.75	0.3	1.4
Q	SYSTEMATICS INC	37	26	34.5	2.5	7.8
N	SYSTEM CENTER INC	26	13	23	-0.6	-2.6
N	SYS. SOFT INC	27	11	24.375	1.9	8.3

Semiconductors

N	ADV MICRO OEVICES INC	14	7	8.5	-0.5	-5.6
N	ANALOG OEVICES INC	14	10	10.125	0.0	0.0
Q	ANALOGIC CORP	11	7	9.875	-0.1	-1.3
Q	CHIPS & TECHNOLOGIES INC	26	11	22.25	-0.4	-1.7
Q	INTEL CORP	35	19	29.75	1.3	4.4
Q	LSI LOGIC CORP	14	8	9.25	0.4	4.2
Q	MICRON TECHNOLOGY INC	26	13	14.875	0.5	3.5
N	MOTOROLA INC	60	36	55.625	0.4	0.7
N	NATL SEMICONDUCTOR	11	7	6.875	-0.1	-1.8
N	TEXAS INSTRS INC	47	35	39.625	0.6	1.6
A	WESTERN DIGITAL CORP	15	8	8.875	0.0	0.0

Peripherals

Q	ALLOY COMP	4	1	1.875	0.0	0.0
N	AM INTL INC	6	5	5.25	0.0	0.0
Q	AST RESH INC	16	7	8.25	-0.6	-7.0
Q	AUTO TROL TECH CORP	6	4	4.625	-0.3	-5.1
Q	BANCTEC INC	16	8	15.375	0.5	3.4
Q	CIPHER DATA PROOS INC	11	7	7.75	-0.5	-6.1
A	COGNITRONICS CORP	7	2	6.5	0.4	6.1
Q	CONNOR PERIPHERALS	15	7	11.125	0.5	4.7
A	DATAPRODUCTS CORP	18	10	13	-0.1	-1.0
A	DATARAM CORP	12	7	11.125	2.5	29.0
N	EASTMAN KODAK CO	52	42	47.625	0.4	0.8
N	E M C CORP MASS	6	3	5.25	0.0	0.0
Q	EMULEX CORP	12	7	8.25	0.1	1.5
Q	EVANS & SUTHERLANO	22	13	20.5	0.0	0.0
Q	ICOT CORP	4	1	1.5	-0.3	-14.3
Q	INTERLEAF INC	12	6	7.75	0.0	0.0
Q	IOMEGA CORP	5	2	2.75	0.3	10.9
Q	LEE DATA CORP	4	2	2.375	-0.1	-5.0
Q	MASSTOR SYS CORP	4	2	3.563	0.6	18.8
Q	MAXTOR CORP	11	6	8.625	-0.4	-4.2
Q	MICROPOLIS CORP	13	3	3.875	-0.5	-11.4
Q	MINISCRIBE CORP	12	1	2.875	0.1	2.2
N	MINNESOTA MNG & MFG CO	77	35	75.5	2.0	2.7
Q	PERSONAL COMP PROD INC	6	4	4.563	0.1	1.4
Q	PRIAM CORP	2	0	0.469	0.0	0.0
Q	PRINTRONIX INC	11	7	8.25	0.9	11.9
N	QMS INC	11	6	9.625	-0.4	-3.8
Q	QUANTUM CORP	25	7	24.25	0.5	2.1
N	RECOGNITION EQUIP INC	13	6	9	-0.3	-2.7
Q	REXON INC	8	6	7.625	0.3	3.4
Q	SEAGATE TECHNOLOGY	16	7	11.25	0.5	4.7
N	STORAGE TECH CORP	25	11	12.375	0.3	2.1
Q	TANDON CORP	2	0	0.625	0.1	11.0
N	TEKTRONIX INC	24	19	22.125	0.0	0.0
Q	TELEVIOEO SYS INC	1	0	0.313	0.1	25.2
N	XEROX CORP	69	52	67.375	0.6	0.9

Leasing Companies

Q	AMPLICON INC	115	11	13.75	-0.8	-5.2
N	CAPITAL ASSOCIATES INTERNATIONAL INC	9	5	7	-0.6	-8.2
N	COMDISCO INC	29	19	28.625	1.0	3.6
Q	CONTINENTAL INFO SYS	5	0	0.625	0.1	11.0
Q	LDI CORPORATION	17	13	15.75	-0.3	-1.6
Q	PHOENIX AMERN INC	5	3	4.125	-0.3	-5.7
Q	SELECTERM INC	9	5	8	-0.3	-3.0

EXCH: N — NEW YORK; A — AMERICAN; Q — NATIONAL

One of each

Most shares took a breather, but Wang and Compaq stood out

The technology market was relatively quiet this week, with two notable exceptions: one a big winner and one a big loser. After stumbling early in the week, Compaq Computer Corp. recovered — and then some. Perhaps the 30% increase in second-quarter earnings finally sparked investors' interest, or it may have been the company's predictions for a healthy personal computer market next year. Whatever it was, Compaq shares shot up 6⅛ points to close Thursday at 91½.

The word at Wang Laboratories, Inc., however, was anything but optimistic. After reporting a $374 million loss in its fourth quarter, Wang announced it would soon decrease its work force — already heavily cut by layoffs and attrition — in an effort to control costs. Its shares dropped ⅝ of a point to close at 5¾. Sun Microsystems, Inc. also announced an expected fourth-quarter loss; Sun slid ⅜ of a point to close at 14⅜.

Network Equipment Technologies, Inc. climbed 1⅝ to close at 23⅝. Apple Computer, Inc. added 1⅞ to finish at 41¼. Intel Corp. rose 1¼ points, closing at 31, and Lotus Development Corp. finished up 1 point at 25¾. Both Digital Equipment Corp. and IBM ended the week up slightly — DEC closed at 93¾, up ¾ of a point, and IBM inched up ⅜ of a point to finish at 113¾.

JOSEPH J. FATTON

Wall Street IS investment up

BY MARYFRAN JOHNSON
CW STAFF

NEW YORK — A robust upward trend in high-tech spending on Wall Street was the bottom line of a recent confidential survey of 30 major securities and investment firms.

Yet flourishing technology budgets are more likely a sign of necessity than a thriving market, said the New York consultant who conducted the survey.

"In spite of the cost-cutting programs [following the October 1987 market crash], technology budgets were up about 10% across the board," said Jerry Tellefsen at Tellefsen Consulting Group.

"To just maintain a reasonable level of technology, budgets have to go up," he added, "because member firms are required to interface with external systems that didn't exist before."

Tellefsen's "Securities Industry Technology Directions and Trends" survey queried IS directors at such firms as Prudential Bache Securities, Inc. and Drexel Burnham Lambert, Inc.

"I thought the survey reflected positively on our operation," William Anderson, chief information officer at Prudential Bache in New York, told *Computerworld* last week. "I was surprised they could find that many to respond in the financial service world. Thirty is a big number."

Among those responding to the mail-in questionnaire, more than three-quarters had increased this year's technology budget over 1988 expenditures — and half of those increases were more than 20%.

Far from shipshape

Users rate the current status of their applications systems

	Percent of respondents		
	Good shape	*Needs work*	*Rewrite planned*
Customer data	**18%**	**64%**	**18%**
Order processing	**61%**	**11%**	**28%**
Portfolio management	**33%**	**43%**	**24%**
Clearing/Settlement	**50%**	**30%**	**20%**
Risk management	**28%**	**61%**	**11%**
Analytics	**19%**	**69%**	**12%**
Trader workstation	**47%**	**33%**	**20%**
Broker (retail) workstation	**25%**	**58%**	**17%**

SOURCE: TELLEFSEN CONSULTING GROUP CW CHART

Casting ahead to 1990, the managers overwhelmingly predicted further expansion of their budgets. About one-third of them saw increases coming in the 10% to 15% category, and another one-third were figuring on 5% to 10% growth.

For one survey participant — Drexel Burnham Lambert — high-tech spending is firmly on the downturn. The company is selling off many of its retail branches in a substantial downsizing move.

"We're not one of the spenders. We are in the percentage expecting a decrease," said Joseph Castellano, managing director of information systems at Drexel. "We're streamlining and eliminating waste to find the money to do strategic things."

Castellano said he believed many Wall Street companies were still tightening their operations despite the optimistic survey findings.

"A lot of these surveys come in and they don't tend to get filled out by the right people," he cautioned. Not knowing the identities of the other survey participants also made the information less useful, he added.

Ben Kuenemann, senior managing director for information services at Bear Stearns Co., said his IS budget would be growing by 10% or less. "We're trying to find ways to do things cheaper as we go," he said.

Predictions of larger IS budgets may be a combination of wishful thinking and a sharpening awareness of computing needs, Kuenemann added. "When volume in the street dries up, people have time to figure out what they need from an automation standpoint," he said.

The IS directors had a laundry list of complaints about their major applications systems, particularly in customer data, risk management, analytics and broker workstations. The majority named those areas as "needs work" or "rewrite planned."

Their most important technological needs were identified as equipment upgrades, local networking, user understanding and system reliability.

"Picture the MIS director with four fishhooks in him," Tellefsen said. "He's being pulled by his users, pulled by new product announcements, pulled by the need to integrate with new external systems and pulled by new technology."

The good, the fair, the poor

In a confidential survey released to *Computerworld* by Tellefsen Consulting Group in New York, 30 information systems directors at securities and investment banking companies rated hardware, software and services from seven major computer companies, which included Apple Computer, Inc., Compaq Computer Corp., Digital Equipment Corp., IBM, Stratus Computer, Inc., Sun Microsystems, Inc. and Wang Laboratories, Inc.

Wang earned the worst software grades, with six of the managers ranking its software as "poor" and the rest rating it only "fair." Overall, Wang came home with the most embarrassing report card. About one-third of the IS directors rated its service as "poor," and all respondents ranked its hardware as only "fair."

The survey also confirmed that hardware environments are migrating steadily toward workstations and microcomputers at the large securities firms (see chart).

Boost for hardware

Users assess their commitment to their hardware environments during the next two years

	Percent of respondents		
	Increase	*No change*	*Decrease*
Mainframes	**30%**	**25%**	**45%**
Minis	**55%**	**30%**	**15%**
Workstations	**86%**	**10%**	**4%**
PCs	**70%**	**26%**	**4%**

SOURCE: TELLEFSEN CONSULTING GROUP CW CHART

Industry giant IBM scooped up good grades from three-fourths of the managers for hardware, software and services. Yet, Apple, Compaq, DEC and Stratus all beat out IBM for hardware quality among those surveyed, and both Apple and Stratus received higher percentage rankings for software. Stratus also tied with IBM for the best service.

Apple hardware was rated "good" by all of the managers, and most of them thought its software was good as well. But in the service category, Apple pleased only half of the managers surveyed, and a few ranked its service as "poor."

DEC hardware outstripped IBM, with most of the managers ranking it as good, but it fared poorly with its software — a majority gave it only a "fair" grade. Sun's software got a 50-50 vote, split between good and fair.

MARYFRAN JOHNSON

Fortune 500 demands diverse routes

BY ELISABETH HORWITT
CW STAFF

Guaranteed route diversity service — in effect, a redundant communications network — has become a major user concern and thus a selling point for carriers in the escalating war for Fortune 500 customers' business.

When a construction crew severed AT&T's main fiber-optic line for the Northeast corridor last November [CW, Nov. 21], it interrupted business communications — 3.5 million calls — for a lot of customers, including some whose backup lines happened to run over the same cable as their primary lines.

"We sure did get hit when AT&T's fiber was severed, but alternate facilities with AT&T and other carriers allowed us to get back on-line in half an hour," said Stanley Welland, manager of telecommunications at General Electric Co.

Increasingly, major users are demanding that carriers insure them against this kind of disaster by guaranteeing that the primary and backup lines exist on different cabling and switching facilities. The issue was a major motivator in GE's decision to divide its gigantic long-distance telecommunications budget among AT&T, U.S. Sprint Communications Co. and MCI Communications Corp.

"If I run all my services on a single carrier's bundle of fiber, all my stuff is very vulnerable to the farmer with a backhoe putting in a fence," Welland said.

Companies such as Westinghouse Electric Corp. and Prudential Insurance Co., which recently opted for just one major long-distance carrier, made sure that guaranteed routing diversity was stipulated in their contracts. "AT&T told us they would indicate to us, route by route, where we have vulnerabilities and allow Prudential to bring in another carrier if AT&T's solution proved inadequate," said Prudential Vice-President of Information Systems William Rush.

Right now, MCI claims to have diverse routing for 80% to 90% of its network, while both AT&T and U.S. Sprint said they expect to provide diversity throughout their main networks — not including spurs to remote regions — by year's end.

The rest of the walk

But route diversity is only the first step for major companies that can lose millions of dollars if a line is out for just a few minutes. A bigger question is whether once an outage has occurred transmissions can be routed to the backup link fast enough to avoid the loss of key data or connections. For example, IBM hosts will disconnect sessions with remote terminals if a link is down for more than 22 seconds.

Recovery speed is a major concern for Drexel Burnham Lambert, Inc. as it prepares to make its final choice of a major communications provider for its high-speed network backbone.

All three of the major carriers have offered Drexel a service that automatically routes transmissions off downed lines to "another piece of bandwidth assigned [as backup]," said Kam Saifi, the investment firm's assistant vice-president for communications planning.

The charge for the service is between 10% and 15% of the primary-line rate, a big savings over "having a redundant T1 link sitting waiting for something to fail," Saifi noted.

All three major carriers said that they were in the process of upgrading their digital-access and cross-connect switches to be able to handle bandwidth more dynamically and in smaller increments.

The current technology is more geared to handling T3 increments of 45M bit/sec., industry sources said. AT&T's ultimate goal is to turn routing diversity and automatic backup into standard features through a "self-healing network" that will automatically reroute transmissions to backup lines, said Daisy Ottman, a spokeswoman for AT&T.

Many users that need dynamic bandwidth recovery within seconds do it themselves through intelligent T1 switches, according to MCI executive staff member Ned Farinholt. MCI has agreed to co-locate such switches on its own premises, giving customers access to its round-the-clock maintenance facilities, he added.

Buyers eschew large systems

Mini, mainframe vendors squeezed in face of recession-shy IS managers

BY ALAN J. RYAN
CW STAFF

TEMPE, Ariz. — "Ouch!" is what some vendors of large computer systems will be saying next year if system buyers remain cautious in the face of a possible recession.

When information systems managers open their wallets next year — which they expect will include 3% to 10% more dollars — their most aggressive spending will be in the local-area network and personal computer markets, according to a recent poll by The Sierra Group, Inc., based here. Minicomputer and mainframe vendors will feel the pinch, the report said.

In the July survey of 50 top IS executives at Fortune 500 companies, two-thirds of those polled expressed concern about a recession.

In a similar poll in June, just one-third of the IS executives expressed that concern. All of those surveyed are participants in the 150-member Sierra Group/First Boston MIS Executive Council.

Since the beginning of 1989, "there has been a marked upswing in concern about a recession," said Sierra Group Vice-President Marty Gruhn. Those concerns will result in careful spending of dollars next year and will affect vendors.

"Most of the industry's attention is being focused on when things will turn around," the report said. But there are changes going on in the computer industry that will put normality on hold, according to the study.

One factor is competitive pressure and pricing wars between vendors, which leads to eroding margins.

At the same time, customers are becoming more demanding and are less willing to accept what vendors offer them.

"If one company listens to its users, suddenly they all have to listen," said an IS vice-president at a large health organization.

Companies that continue to work under the belief that the computer industry is still driven by the technologies they introduce rather than customer demands are mistaken, the report added. Hugh Naughton, director of IS at Gas Research Institute in Chicago, said he agrees — up to a point.

Naughton, who was not a participant in The Sierra Group's survey, said customers have become more demanding about what they need from their mainframe and minicomputer software.

"We are demanding that they make what we have work rather than getting something that is bigger and faster," Naughton said.

However, the vendors are still the driving force behind such new technologies as imaging and database technology, he said.

Additionally, The Sierra Group said, large companies such as IBM and Digital Equipment Corp. are becoming more aggressive. They are increasingly moving into niche markets and will likely take business away from smaller companies that discovered the niches.

When asked whether they have noticed a change in IBM's pricing in the last three to six months, 21 of the 50 respondents said that they had. And when asked whether or not IBM's prices are more aggressive than they were six months ago, 39 of the respondents answered affirmatively.

The aggressiveness on IBM's part did not necessarily have to reflect an actual price, Gruhn said. She said participants in the survey said instead that IBM was more willing to bundle some systems with service and support or throw some software into the deal. IBM "showed more flexibility in how to construct a deal," she said.

Late and lethargic

Late products and lethargy have also taken their toll.

"Vendors like Ashton-Tate Corp. are facing the result of products that shipped with too many bugs and were delivered too late," the report said. "Customers found other alternatives."

In the hardware area, minicomputer vendors, including Wang Laboratories, Inc. and Data General Corp., are facing the marketplace's acceptance of alternative technologies, according to the study.

"If minicomputer vendors could count on the sales going to PC-based solutions, they would have the profitability that is elusive today," according to the report.

Addition and subtraction

Among 50 IS executives surveyed, 41 plan to boost their budgets, but spending on mainframes and minis will take a backseat to PCs and LANs

Q.
Are there areas you plan to aggressively expand or cut in 1990?

Cut

Number of respondents	
− Mainframes	7
− Minis	5

Expand

Number of respondents	
+ LANs	27
+ PCs	15
+ Minis	5
+ Software	4
+ Imaging	1
+ WANs	1
+ Mainframes	1

SOURCE: THE SIERRA GROUP, INC. CW CHART: JOHN YORK

Lotus, Symantec come out with Deskmate tools

BY RICHARD PASTORE
CW STAFF

Lotus Development Corp. and Symantec Corp. last week announced versions of popular packages — the 1-2-3 spreadsheet and Q&A Write word processor, respectively — that will run under Tandy Corp.'s Deskmate graphical user interface.

Designed for ease of use, the Deskmate interface includes a menu bar, pull-down menus, dialog boxes and a Help system. Tandy has been licensing the interface to software developers on a royalty-free basis since March 1988.

Deskmate, which reportedly has about one million installations, is targeted at smaller businesses and home-office users. It operates on Tandy machines and all other IBM Personal Computer compatibles based on Intel Corp. 8088, 8086 and 80286 technology.

Lotus, the latest developer to take advantage of the interface license, introduced the Lotus Spreadsheet for Deskmate. The product is based on the technology of 1-2-3 Release 2.01. Its operation is comparable to that of 2.01, except that it does not offer macros, add-in capability or memory expansion, the company said.

The spreadsheet was not based on the newly released 1-2-3 Version 2.2, which was not ready when Lotus was developing its Deskmate product, a Lotus spokeswoman said. Also, 2.2's target market does not match the Deskmate market as well as 2.01 does, she noted.

The spreadsheet supports a mouse and reportedly works with other Deskmate applications and accessories. It requires DOS 3.2 or higher and at least 512K bytes of memory. The package is scheduled to ship in the fourth quarter and will retail for $219.95 at Tandy's 7,000 participating Radio Shack stores and dealers in the U.S.

Symantec's Deskmate Q&A Write, based on Q&A Write Version 1.01, was designed as a simplified word processor. However, it features advanced functions such as an undelete command, multiple-column printing, instant page preview and font support, according to Gordon Eubanks Jr., the Cupertino, Calif.-based company's president. The product is also integrated with Lotus' 1-2-3 and Symphony.

Symantec recommends running the program on machines with 640K bytes of memory. The package is slated to be available Aug. 31 and will retail at Tandy outlets for $149.

SQL Server

FROM PAGE 1

on Sybase technology, is the only product that offers referential integrity of the caliber promised by IBM's DB2, which he said is a prerequisite for building distributed applications.

Prior to the announcement, users had few options when using SQL Server, which comes with SAF, a full-screen editor that runs under MS-DOS and OS/2. Tarbox said that SAF lacks the report formatting that users want and need.

Ashton-Tate plans to release a front end in Dbase IV Version 1.1, due in the third quarter, but Richard Finkelstein, president of Performance Computing, Inc. in Chicago, said, "The only other way to use SQL Server now would be to write in C language, which doesn't bring productivity."

Finkelstein said that besides a few minor products, essentially line editors, "Focus for SQL Server is the first full-blown front end on the market."

He added that Information Builders, as a reseller of SQL Server, will be able to give end users a sole source and dependable support for both the front end and the back end — an important issue because "there have been too many sales companies getting involved in the process."

According to Information Builders, the interface in Focus for SQL Server translates Focus syntax into appropriate SQL procedures and fully supports unique SQL Server features, such as stored procedures, that have no counterpart in Focus.

The firm claimed that users will be able to access SQL Server functionality without leaving the Focus environment. For example, developers and end users can embed extended SQL Server syntax, called Transact-SQL, within a Focus application or interactively from the Focus command-line prompt.

A complete Focus for SQL Server system at the workstation requires OS/2 Release 1.0 or higher, PC/Focus for OS/2 Release 3.1A, priced at $1,250, and a Focus for SQL Server interface, which costs $395 for four users. The SQL Server component is priced at $2,495. In addition, it requires Microsoft LAN Manager, a compatible local-area network and a minimum of 4M bytes of random-access memory when using OS/2 1.1 or higher.

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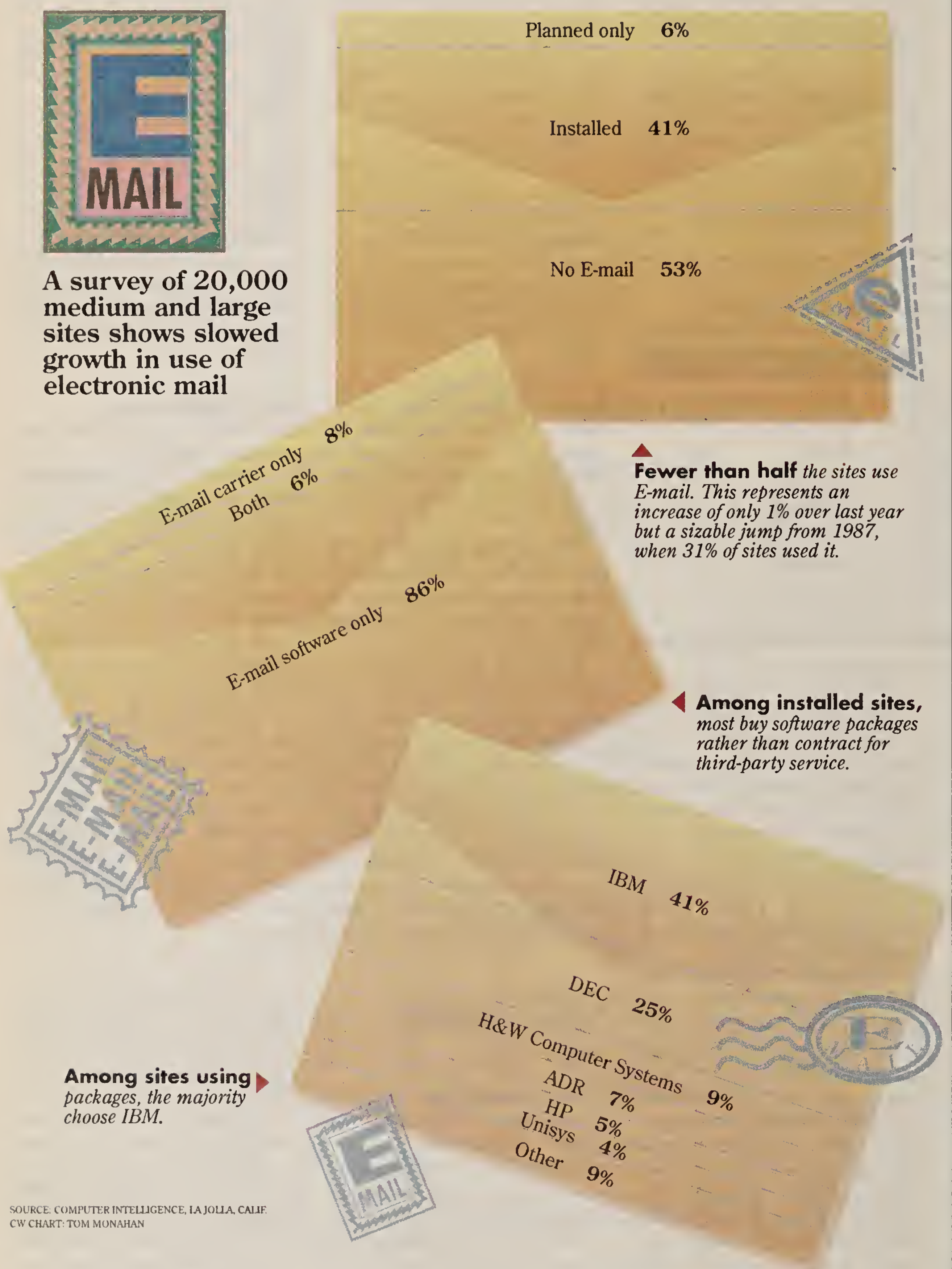


A survey of 20,000 medium and large sites shows slowed growth in use of electronic mail

Fewer than half *the sites use E-mail. This represents an increase of only 1% over last year but a sizable jump from 1987, when 31% of sites used it.*

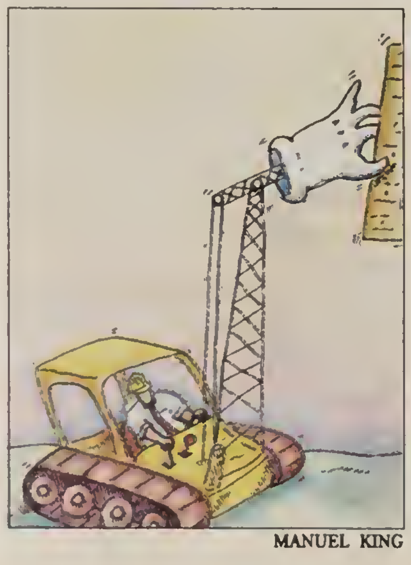
Among installed sites, *most buy software packages rather than contract for third-party service.*

Among sites using *packages, the majority choose IBM.*

SOURCE: COMPUTER INTELLIGENCE, LA JOLLA, CALIF.
CW CHART: TOM MONAHAN

NEXT WEEK

Many companies have become thick around the middle and are looking for ways to trim accumulated layers of management personnel. However, flatter organizational structures require considerable IS support, especially in terms of devising systems that can channel information. Manager's Journal looks at several such reshaping efforts.



MANUEL KING

A recent Defense Department initiative may prove a real peacekeeper — and suitable for commercial use. Computer-aided acquisition and logistics support is an enhanced version of EDI that permits electronic exchange of engineering drawings and technical manuals, reducing product development delays. See In Depth for details.

INSIDE LINES

The halls of misery

A former Wang salesman who called last week painted a glum picture of morale at the Lowell, Mass. headquarters. "What's really going to hurt Wang is that you don't know from one day to the next whether you'll have a job," he said, adding that as a result, employee commitment is missing. He also questioned the impact that severance pay has had on Wang's bottom line, alleging that only a small minority of employees actually received severance: "Most of the people who were let go were terminated." He said Wang fired people who came in late three consecutive days and told some Florida employees affected by consolidation efforts that they could keep their jobs if they moved to Atlanta — at their own expense. More layoffs won't help morale, but that's exactly what analysts are expecting, and Wang has said it will happen.

If we'd only known

Prior to the launch of the 9370 in 1986, IBM intended to offer the processor with no support for its VSE operating system as part of a plan to kill off VSE, according to a former IBM developer who was working on the 9370 project at the time. Surveys of customers led IBM to overturn its plan and offer VSE, the ex-IBMer said. According to reports, about half of all 9370 installations run VSE. Can you imagine what we'd be saying about the 9370 if all those VSE users were removed from the installed base?

Cutting the DEC . . .

The layoffs haven't occurred, but word is that Ken Olsen has instituted a new hiring policy designed to reduce manufacturing and engineering staffs. In order to fill one position, a DEC manager is required to show that two have been disposed of through attrition or other means. This reportedly supplements an earlier hiring and wage freeze already in progress at DEC.

. . . getting to the chaff

DEC will huddle with five database management systems vendors at Adapso headquarters on Thursday. The topic: DEC's alleged bundling of relational DBMSs with its VMS and Ultrix operating systems, something Adapso views as anticompetitive. Adapso wants DEC to uncouple its RDB from VMS and change its plans to include an Ingres-based RDBMS with Ultrix.

OMG: Only Missing Giants?

When several major vendors, led by Hewlett-Packard, got together in April to form the Object Management Group to promote a standard method of managing objects, conspicuously missing from the roster were IBM, DEC and AT&T. But according to Chris Stone, acting director of OMG, that may soon change. Stone claimed that at least one of the "big three" has signed on.

David readies slingshot

Little Netwise plans to put up its own remote procedure call against the DEC-HP contingent as a candidate for inclusion in the Open Software Foundation's distributed architecture. The company revealed that it will respond to the Foundation's "Request for Technology" search for candidates within a couple of weeks, with backing "from a number of entities," including both vendors and standards organizations. Likely allies include both Prime and Novell, which license Netwise's technology.

M-Byte Fashion. The 4M-byte memory chip tie clasp seems to confer more authority than a mere 1M-byte tie clasp, according to an informal poll among the many wearers of the accessory, which has shown up in Western states during the last few months. The 4M-byte tie clasp means that the wearer has connections in the semiconductor world. A 1M-byte clasp may not yet be a fashion casualty, but it's definitely last year's neckwear. As always, Valley scuttlebutt is more than welcome at the hot line (800-343-6474 or 508-879-0700), where News Editor Pete Bartolik directs the tip traffic. You can also contact him and other staffers and readers on our bulletin board at 508-626-0214.

A Guide to Advanced 3270 Micro-Mainframe Connectivity
EXTRA!
Keeping your options open
PC Host Automation

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PC WEEK

THE PC WEEK POLL OF CORPORATE SATISFACTION

3270-Board Buyers Sidestep DCA, Turn to Attachmate

In a surprising upset, Attachmate Corp. edged out longtime market leader Digital Communications Associates Inc. (DCA)—the maker of IRMA boards—as the top-ranked 3270 PC-to-mainframe connectivity product, according to the results of this week's Poll of Corporate Satisfaction on 3270 Emulation Boards.

The Attachmate 3270 Coax Adapter trounced DCA's IRMA CUT board and IBM's Model 3278/79 emulation adapter, with an overall score of 82 out of 100 points. The 238 poll respondents ranked IBM and DCA next with overall scores of 76 and 75, respectively.

While this survey may be the first to reveal the degree of corporate satisfaction with 3270 emulation board products, it is not the first indication of Attachmate's growing market share.

Dataquest Inc., a market research firm in San Jose, Calif., for example, recently published a report indicating great strides made by Attachmate. Attachmate overtook IBM as the No. 2 seller of 3270 emulation boards in the first half of 1988 (DCA was No. 1), according to the Dataquest report.

Novell Inc.'s PCOX/MELTI Coax board, the fourth product included in the poll results, was ranked next with the low overall score of 71 points—11 points away from top-placed Attachmate.

Compatibility Concerns

The respondents ranked PC hardware compatibility as the most important attribute in a new 3270 emulation board, with a score of 94 points. Attachmate, of Bellevue, Wash., and IBM, of Armonk, N.Y., tied for the high score in this category, with scores of 81 points. The DCA board was rated next with an 80 and Novell was last with 74 points. DCA is located in Alpharetta, Ga., and Novell is headquartered in Provo, Utah.

In the software-compatibility category, which tied with overall reliability as second in importance, the IBM and Attachmate products pulled well ahead of the DCA and Novell boards. Respondents ranked IBM first with a score of 81 and Attachmate second with 79 points.

However, it was Attachmate's Extra! 3270 Connectivity Software, bundled with the Attachmate 3270 Coax Adapter, that played a significant role in winning the affections of many survey respondents.

With memory a key concern for users of 3270 emulation products, survey respondents praised the Attachmate software for its frugal memory conservation.

"It's very economical in terms of memory," said Steve Boyle, supervisor of information systems technical support for the Virginia Employment Commission and user of the Attachmate 3270 Coax Adapter. "Especially for multiple sessions, we need to squeeze out all the memory we can get."

Also, Boyle added, users are often in a position where they must drop 3270 software out of memory to run large applications. Attachmate's software makes this process quick and painless, he said.

Bob Simon, information center supervisor at CNG Producing Co., also praised the Extra! menu system. "The hierarchical menu system [for PC host connectivity] effectively simplifies a complex process," Simon pointed out.

What's more, added Tom Robertson, a programmer analyst for First Federal Savings & Loan, Extra! software offers a high degree of flexibility in terms of connectivity options.

"It runs on LANs, Token Ring and through coax direct," Robertson said.

Of even more importance is Attachmate's software compatibility.

Daniel Kronstadt, director of technical support for Warner Brothers Inc., noted that, working in an IBM shop, he feels very comfortable with the high level of IBM compatibility offered by Attachmate's software.

"This means I can run IBM software on Attachmate's board [illegible]," Kronstadt said.

[illegible] points.

While DCA's IRMA software may have been the de facto standard for years, its weakness lies in its low degree of IBM compatibility, according to many respondents. "You can't run IBM software on the board," said Kronstadt.

Other factors limit the flexibility of IRMA software for users. Different software is required for the coaxial and modem connection, and DCA's use of application programming interfaces (APIs) is very different from IBM's, Kronstadt said.

Novell fared even worse. Novell's "erratic" implementation of the various APIs is a likely cause of the product's low ratings in terms of software compatibility, according to Stan King, executive vice president for Mackensen Corp., a research and development group for micro-to-mainframe communications.

"Their DCA-style emulation is not implemented 100 percent, their 3270-style emulation is not 100 percent and their IBM presentation space API is not 100 percent," King said.

ATTRIBUTES

Performance Is Not a Major Concern For 3270 Emulation-Board Buyers

Find out what 238 experts know about the #1 choice in PC-mainframe connectivity.

A *PC Week* poll of 238 connectivity pros put Attachmate at the top in 10 key categories, including overall performance, IBM compatibility, documentation and support. We want to put this information into your hands immediately, plus a LAN-mainframe article from *PC Magazine* that bestowed the coveted "Editor's Choice" award on Attachmate's EXTRA!™ software. To get a head start on *your* evaluation process, call for your free copies now: 1-800-426-6283.

Attachmate

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PC Magazine "Editor's Choice," December 13, 1988

CHOOSING BETWEEN MSA AND MCCORMACK & DODGE IS LIKE CHANGING SEATS ON THE TITANIC.

She was a paragon of the world's technology, dubbed "the unsinkable ship." But what should have been an ocean-going triumph turned to tragedy due to poor planning, inept management, and lack of foresight.

Times haven't changed much.

In this day and age, the hazards of the software seas remain much the same. Poor product releases, inexperienced and ineffective customer support, and technological inflexibility riddle the mainframe software giants. The hidden costs of software and support still lurk beneath the surface. And changes decreed by IBM—such as SAA—make for even rougher seas ahead.

That's why if you're in the market for financial software, you shouldn't limit your choices to the old familiar names in the software industry to deliver you safely to your destination.

Instead, look at Data Design Associates.

We run a tight ship at Data Design by following a few basic rules. No big secrets. Our product teams consist of seasoned financial and data processing professionals. We develop all our systems in-house. We listen to our customers. And we adhere to industry standards.

The results are impressive.

Built upon our Eqqual® architecture, Data Design's financial software is perfectly suited to meet your constantly changing corporate demands for hardware and software flexibility. And perfectly developed to conform to SAA standards.

In short, you get software that is more efficient, easier to maintain and install, and more responsive to your business needs than any other software solution available. All backed by the highest quality customer support in the industry. From a company that has consistently increased sales and profit for over 16 consecutive years.

Perhaps that's why over two-thirds of our clients previously used MSA and M&D financial software. And why Alcoa, Bristol-Myers, Esprit, MasterCard International, Pillsbury, Warner-Lambert, and hundreds of other Fortune 1000 companies all rely on Data Design for comprehensive corporate financial management.

Don't wait for MSA and M&D to raise the Titanic. Call Data Design at (800) 556-5511. We promise you smooth sailing ahead.

Data Design Associates

YOUR NEXT CHOICE

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